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Environmental Assessment for Coal Planning Decisions in the Carbon Basin Area of the Great Divide Resource Area

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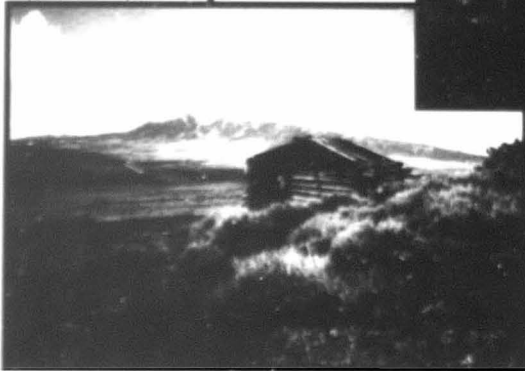
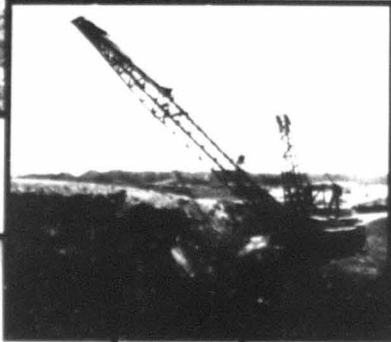
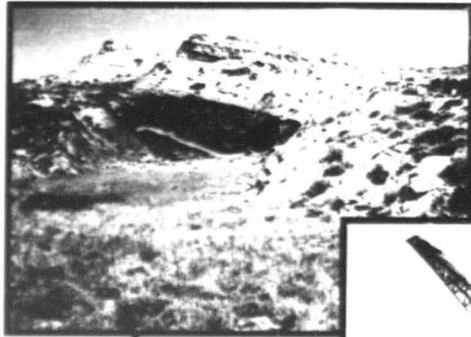
U.S. Department of the Interior
Bureau of Land Management
Rawlins District Office

Great Divide Resource Area

November 1997



Environmental Assessment for Coal Planning Decisions in the Carbon Basin Area of the Great Divide Resource Area



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The Bureau of Land Management is responsible for the balanced management of the public lands and resources and their various values so that they are considered in a combination that will best serve the needs of the American people. Management is based upon the principles of multiple use and sustained yield, a combination of uses that take into account the long term needs of future generations for renewable and nonrenewable resources. These resources include recreation, range, timber, minerals, watershed, fish and wildlife, wilderness and natural, scenic, scientific and cultural values.

BLM WY PL-97-025-1320

WY-037-EA7-146

I



United States Department of the Interior

BUREAU OF LAND MANAGEMENT

Wyoming State Office
P.O. Box 1828
Cheyenne, Wyoming 82003-1828

**NOTICE OF AVAILABILITY
ENVIRONMENTAL ASSESSMENT
EA# WY-037-EA7-146
COAL PLANNING DECISIONS
IN THE CARBON BASIN AREA,
CARBON COUNTY, WYOMING**

Dear Reader:

Enclosed for your review and comment is the environmental assessment (EA) documenting a planning review of the Carbon Basin area, within the Bureau of Land Management (BLM) Great Divide Resource Area, Carbon County, Wyoming. The planning review area (the Carbon Basin area) is comprised of about 38,460 acres of intermingled and overlapping land surface and mineral ownerships. These ownerships include BLM administered public land surface and federal minerals, and private and state land surface and minerals.

The purpose of conducting the planning review is to develop coal planning decisions for the federal coal lands in the planning review area because the coal screening/planning process was not conducted on, and coal planning decisions were not made for the Carbon Basin area during development of the Great Divide Resource Management Plan (RMP). This situation came about because sixty percent of the federal coal lands located in the Carbon Basin area were leased at the time the RMP was prepared and were, therefore, exempt from the coal screening/planning process. Subsequently, development of this lease was never pursued and the lease expired. Also at the time the RMP was prepared, there was no other interest expressed by industry in obtaining federal coal leases in the area. Now that there is interest in leasing federal coal in the area, the coal screening/planning process must be conducted on the area, and a determination of federal coal lands that are acceptable for coal development and further leasing consideration in the area must be made before any such leasing consideration can be given.

This EA describes two alternatives in detail, including the BLM's preferred alternative, for managing the federal coal lands within the planning review area. Alternative 2, the Federal Coal Leasing and Development Alternative, is the BLM's preferred alternative for managing the federal coal lands within the planning review area. The environmental consequences of implementing each of the alternatives are also described.

The preferred alternative includes continuing other existing management that is consistent with the Great Divide RMP. If selected, the preferred alternative would also result in amending the Great Divide RMP to include the federal coal planning decisions for the Carbon Basin area.

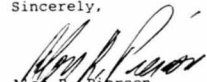
FINDING OF NO SIGNIFICANT IMPACT (FONSI) -- Based on the analysis of potential environmental impacts presented in this environmental assessment, impacts of the preferred alternative are not significant and an environmental impact statement is not needed.

You are invited to comment on the alternatives presented, the adequacy of the environmental analyses of the alternatives, documented in the EA, the FONSI, and on the results of conducting the coal screening process (particularly the application of the coal unsuitability criteria). You will have 30 days after the date of publication of the notice of availability (NOA) of this EA in the *Federal Register* to submit your comments. Direct your comments to Karla Swanson, Great Divide Resource Area Manager, Bureau of Land Management, Great Divide Resource Area, 1300 North Third Street, Rawlins, Wyoming 82301. Interested parties may also obtain further information and direct questions or concerns to Brenda Vosika-Neuman, Mining Engineer, or John Spehar, Planning and Environmental Coordinator, who can be visited at the above address or reached by telephone: (307) 328-4200.

The 30-day review/comment period will begin the day following the date of publication of the NOA of this EA in the *Federal Register*. Comments on the alternatives, the adequacy of the environmental analyses, the FONSI, and the application of the coal unsuitability criteria will be fully considered and evaluated in development of the decision record.

Through your participation, we look forward to improved public land management in the Carbon Basin Coal Area.

Sincerely,


Alan R. Pierson
Wyoming State Director

Enclosure

II

III

**ENVIRONMENTAL ASSESSMENT
EA# WY-037-EA7-146**

**COAL PLANNING DECISIONS
IN THE
CARBON BASIN AREA,
CARBON COUNTY, WYOMING**

**UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT**

**GREAT DIVIDE RESOURCE AREA
RAWLINS DISTRICT
RAWLINS, WYOMING**

NOVEMBER 1997

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ABBREVIATIONS, ACRONYMS, AND GLOSSARY

ABBREVIATIONS AND ACRONYMS

AVF	Alluvial Valley Floor
BFF	Black-footed Ferret
BLM	Bureau of Land Management
CEQ	Council of Environmental Quality
CFR	Code of Federal Regulations
Corps	U.S. Army Corps of Engineers
CSCC	Cyprus Shoshone Coal Corporation
dBA	A-weight decibel
EA	Environmental Assessment
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
FLPMA	Federal Land Policy and Management Act
FR	Federal Register
gpm	gallons per minute
HMMF	Hazardous Materials Management Plan
HMP	Habitat Management Plan
I-80	Interstate Highway 80
IDT	Interdisciplinary Team
LOP	Life-of-Mine
mg/l	milligrams per liter
NEPA	National Environmental Policy Act
NPDES	National Pollution Discharge Elimination System
NWI	National Wetlands Inventory
ORV	Off-Road Vehicle
OSM	Office of Surface Mining
PSD	Prevention of Significant Deterioration
PMZ	Primary Management Zone
RCA	Raptor Concentration Area
RMP	Resource Management Plan
SHPO	Wyoming State Historic Preservation Office
SMCRA	Surface Mining Control and Reclamation Act
SPCCP	Spill Prevention Control and Countermeasure Plan
T&E	Threatened and Endangered species
TDS	Total Dissolved Solids
TMDL	Total Maximum Daily Loads
TSP	Total Suspended Particulates
TSS	Total Suspended Solids
UP	Union Pacific
USDI	United States Department of the Interior
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
VRM	Visual Resource Management
WDEQ	Wyoming Department of Environmental Quality
WTG	Wind Turbine Generators

N

GLOSSARY

ALLOTMENT. An area allocated for the use of the livestock of one or more qualified grazing permittees. It generally consists of BLM-managed lands but may include parcels of private or state-owned lands. The number and kind of livestock and period of use are stipulated for each allotment. An allotment may consist of several pastures or may be only one pasture.

ALLUVIAL VALLEY FLOORS. Unconsolidated stream-laid deposits where water availability is sufficient for subirrigation or flood irrigation agricultural activities.

ANIMAL UNIT. A standardized unit of measurement for range livestock or wildlife. Generally, one mature (1,000-pound) cow or its equivalent, based on an average daily forage consumption of 26 pounds of dry matter per day.

ANIMAL UNIT MONTH. A standardized unit of measurement of the amount of forage necessary for the sustenance of one animal unit for one month; also, a unit of measurement that represents the privilege of grazing one animal unit for one month.

AQUIFER. A body of rock that is sufficiently permeable to conduct ground-water and to yield economically significant quantities of water to wells and springs.

AREA OF CRITICAL ENVIRONMENTAL CONCERN. An area within the public lands designated for special management attention to protect and prevent irreparable damage to important historic, cultural, or scenic values, fish and wildlife resources, or other natural systems or processes, or to protect life and safety from natural hazards.

ARROYO. Small deep flat-flooded channel or gully of an ephemeral stream or of an intermittent stream, usually with vertical or steeply cut banks of unconsolidated material. The channel is generally dry, but may be transformed into a temporary water course or short-lived torrent after heavy rainfall.

CASUAL USE. Activities ordinarily resulting in no appreciable disturbance of public lands, resources, or improvements; for example, activities that do not involve the use of mechanized earthmoving equipment or explosives or, in areas designated as closed to ORVs, do not involve the use of motorized vehicles.

CATEGORY 1, 2, or 3 CANDIDATE SPECIES. Classification by the Fish and Wildlife Service, U.S. Department of the Interior, of taxonomic groups or species of plants or animals that are being considered for listing as either threatened or endangered under the Endangered Species Act of 1973, as amended.

Category 1 refers to species or taxonomic groups for which the USFWS has on file substantial information on biological vulnerability and threat(s) to support the appropriateness of proposing to list them as endangered or threatened. Data are being gathered on category 1 species concerning precise habitat needs and, for some, the precise boundaries for critical habitat designations.

Category 2 refers to species or taxonomic groups for which information in possession of the USFWS indicates that listing them as endangered or threatened species is possibly appropriate, but for which substantial data on biological vulnerability and threat(s) are not known or on file. Further research and field study usually will be necessary to ascertain the status of category 2 species, and some will not warrant listing while others will be found to be in greater danger of extinction than some listed in category 1.

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Category 3 refers to species or taxonomic groups that are no longer being considered for listing as threatened or endangered, some because there is persuasive evidence of extinction, some because they do not meet the act's definition of "species," and some because they have proven to be more abundant or widespread than was previously believed.

"CLOSED" DESIGNATION (ORV). See the description of off-road vehicle designations under "Recreation" in chapter 1.

CRUCIAL HABITAT. Habitat on which a species depends for survival because there are no alternative ranges or habitats available.

CRUCIAL WINTER RANGE. The portion of the winter range to which a wildlife species is confined during periods of heaviest snow cover.

CULTURAL RESOURCE. A fragile and nonrenewable remnant of human activity, occupation, or endeavor reflected in districts, sites, structures, buildings, objects, artifacts, ruins, works of art, architecture, or natural features.

CULTURAL RESOURCE INVENTORY. A descriptive listing and documentation, including photographs and maps, of cultural resources. Processes involved are locating, identifying and recording of sites, structures, buildings, objects, and districts through library and archival research; collecting information from persons knowledgeable about cultural resources; and conducting on-the-ground field surveys of varying levels of intensity. Also see Cultural Resource Inventory Classes.

CULTURAL RESOURCE INVENTORY CLASSES. A Class I inventory of a defined area provides a narrative overview derived from existing information and a compilation of existing data on which to base the development of the BLM's site record system. A Class II inventory is a sample-oriented field inventory designed to locate and record, from surface and exposed profile indications, all cultural resource sites within a portion of a defined area to make possible an objective estimate of the nature and distribution of cultural resources in the entire defined area. A Class III inventory is an intensive field inventory designed to locate and record all cultural resource sites within a specified area. Upon completion of such an inventory, no further cultural resource inventory work is normally needed in that area.

CULTURAL RESOURCE MANAGEMENT PLAN. A plan designed to inventory, evaluate, protect, preserve, or make beneficial use of cultural resources and the natural resources that figured significantly in cultural systems. The objectives of such plans are the conservation, preservation, and protection of cultural values and the scientific study of those values.

CULTURAL RESOURCE SITE (cultural property). A physical location of past human activities or events. Cultural properties are extremely variable in size, ranging from the location of a single cultural resource feature to a cluster of cultural resource structures with associated objects.

DISPOSAL. Transfer of ownership of a tract of public land from the United States to another party through sale, exchange, or transfer under the Recreation and Public Purposes Act.

ENDANGERED SPECIES. Any plant or animal species that is in danger of extinction throughout all or a significant portion of its range, as defined by the U.S. Fish and Wildlife Service under the authority of the Endangered Species Act of 1973.

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ENVIRONMENTAL ASSESSMENT - Carbon Basin Area

EPHEMERAL STREAM. A stream or reach of stream that flows briefly only in direct response to precipitation in the immediate locality and whose channel is at all times above the water table.

ENVIRONMENTAL ASSESSMENT. A record of the environmental factors involved in a land management action.

ENVIRONMENTAL IMPACT STATEMENT. A written analysis of the impacts of a proposed project and alternatives.

FEDERAL LANDS. As used in this document, lands owned by the United States, without reference to how the lands were acquired or what federal agency administers the lands. The term includes mineral estates or coal estates underlying private surface but excludes lands held by the United States in trust for Indians, Aleuts, or Eskimos. Also see Public Land.

FIRE MANAGEMENT. The integration of knowledge of fire protection, prescribed fire, and fire ecology into multiple use planning, decision making, and land management activities. Fire management places fire in perspective with overall land management objectives.

FIRE SUPPRESSION. All work activities connected with fire extinguishing operations, beginning with discovery and continuing until the fire is completely out.

FULL SUPPRESSION. A fire suppression strategy requiring immediate and continuous aggressive attack to attain the suppression objectives with the least damage of property or loss of resources in the most cost-effective manner. Such actions may include control, containment, or confinement of wildfire to attain land management objectives. The Fire Management appendix contains a more detailed description.

GRAZING PREFERENCE. The total number of AUMs on public land apportioned and attached to base property owned or controlled by a lessee.

GRAZING SYSTEM. A systematic sequence of grazing use and nonuse of an allotment to reach identified multiple use goals or objectives. The Livestock Grazing appendix contains more detailed information.

HABITAT MANAGEMENT PLAN. An officially approved activity plan for a specific geographic area of public land. An HMP identifies wildlife habitat and related objectives, defines the sequence of actions to be implemented to achieve the objectives, and outlines procedures for evaluating accomplishments.

JURISDICTIONAL WETLAND. Wetlands under the authority of the Environmental Protection Agency and the U.S. Army Corps of Engineers pursuant to Section 404 of the Clean Water Act. Such wetlands must exhibit all three diagnostic characteristics including hydrophytic vegetation, hydric soils, and wetland hydrology under normal circumstances.

LEASABLE MINERALS. Minerals subject to lease by the federal government, such as coal, oil and gas, oil shale, potash, sodium, phosphate, and other minerals that may be acquired under the Mineral Leasing Act of 1920, as amended. The major leasable minerals in the planning area are oil and gas and coal.

LEK. A site used by grouse for courtship display. Also called "strutting ground" or "dancing ground." The lek is the center point of the annual reproduction cycle. Most nesting occurs within 2 miles of the lek.

ENVIRONMENTAL ASSESSMENT - Carbon Basin Area

"LIMITED" DESIGNATION (ORV). See the description of off-road vehicle designations under "Recreation" in chapter 1.

LOCATABLE MINERALS. Generally, the metallic minerals subject to development specified in the Federal Mining Law of 1872. Examples are gold, silver, and copper.

MITIGATION. A method or process by which impacts from actions may become less injurious to the environment through appropriate protective measures. Also called mitigative measure.

MONITORING. Specific studies that evaluate the effectiveness of actions taken toward achieving management objectives.

MULTIPLE USE. Coordinated management of various surface and subsurface resources so that they are used in the combination that will best meet present and future needs.

NATIONAL REGISTER OF HISTORIC PLACES. The official list, established by the Historic Preservation Act of 1966, of the nation's cultural resources worthy of preservation.

OFF-ROAD VEHICLE. Any motorized tracked or wheeled vehicle designed for cross-country travel over any type of natural terrain. Exclusions (from Executive Order 11644, as amended by Executive Order 11989) are nonamphibious registered motorboats, any military, fire, emergency, or law enforcement vehicle while being used for emergency purposes, any vehicle whose use is expressly authorized by the authorizing officer or otherwise officially approved, vehicles in official use, and any combat support vehicle in times of national defense emergencies.

OVERBURDEN. Barren rock and soil overlying a mineral deposit.

PERENNIAL STREAM. A stream that flows throughout the year.

PREFERENCE. Grazing privileges established following the passage of the Taylor Grazing Act, based on the use of the federal range during the priority period. The active preference and suspended preference together make up the total grazing preference.

PRESCRIBED FIRE. The application of fire in a controlled manner to a specified area under specific weather conditions (a prescription) to achieve predetermined resource management objectives; the use of fire as a resource management tool.

PUBLIC LAND. As used in this document, federally-owned surface or mineral estate specifically administered by the Bureau of Land Management. Also see Federal Lands.

RIGHT-OF-WAY. The legal right of use, occupancy, or access across land or water areas for a specified purpose or purposes. Also, the lands covered by such legal rights.

RIPARIAN. Situated on or pertaining to the bank of a river, stream, or other body of water. Normally used to refer to plants of all types that grow rooted in the water table of streams, ponds, and springs.

RIPARIAN COMMUNITIES. Communities of vegetation associated with either open water or water close to the surface. Examples are meadows, aspen, and other trees and shrubs associated with water.

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SALABLE MINERALS. Minerals that may be sold under the Material Sale Act of 1947, as amended. Included are sand, gravel, flagstone, scoria, and crushed rock such as limestone.

SPATIAL MANAGEMENT. As used in this document, intensive control of the location and level of surface disturbance that would be allowed in a particular area. Spatial management is described in more detail in the section on assumptions for wildlife in chapter 4.

SPLIT ESTATE. Surface and minerals of a given area in different ownerships. Frequently the surface will be privately owned and the minerals federally owned.

STIPULATION. A condition or requirement attached to a lease or contract, usually dealing with protection of the environment or recovery of a mineral.

SPOIL. The overburden removed in gaining access to a mineral deposit.

STRUTTING GROUND. An area used by sage grouse in early spring for elaborate, ritualized courtship displays. Also see Lek.

SURFACE DISTURBANCE. Disturbance of the vegetative or soil surface by any action. "No surface disturbance" restrictions apply to all activities but casual use and emergency situations such as fire suppression.

SURFACE OCCUPANCY. Placement or construction on the land surface of semipermanent or permanent facilities requiring continual service or maintenance. Casual use is not included.

TEMPORAL MANAGEMENT. As used in this document, intensive control of the period during which the BLM will allow activities that are physiologically disturbing or disrupting to normal wildlife activities such as elk migration. Temporal management is described in more detail in the section on assumptions for wildlife in chapter 4.

THREATENED SPECIES. Any plant or animal species that is likely to become an endangered species throughout all or a significant portion of its range, as defined by the U.S. Fish and Wildlife Service under the authority of the Endangered Species Act of 1973.

UNSUITABILITY CRITERIA. Criteria of the federal coal management program by which lands may be assessed unsuitable for all or certain stipulated methods of coal mining. See Appendix II.

VISUAL RESOURCE. Visible feature of the landscape such as land, water, vegetation, animals, and other features that make up the scenery of an area.

VISUAL RESOURCE MANAGEMENT. The system by which the BLM classifies and manages scenic values and visual quality of public lands. The system is based on research that has produced ways of assessing aesthetic qualities of the landscape in objective terms. After inventory and evaluation, lands are given relative visual ratings (management classes), which determine the amount of modification allowed to the basic elements of the landscape.

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VISUAL RESOURCE MANAGEMENT CLASSES. Visual resource management classes are the degree of acceptable visual change within a characteristic landscape. A class is based on the physical and sociological characteristics of any given homogeneous area and serves as a management objective. The four classes are described below:

Class I provides for natural ecological changes only. This class includes primitive areas, some natural areas, some wild and scenic rivers, and other similar areas where landscape modification activities should be restricted.

Class II areas are those where changes in any of the basic elements (form, line, color, or texture) caused by management activity should not be evident in the characteristic landscape.

Class III includes areas where changes in the basic elements (form, line, color, or texture) caused by a management activity may be evident in the characteristic landscape. However, the changes should remain subordinate to the visual strength of the existing character.

Class IV applies to areas where changes may subordinate the original composition and character; however, they should reflect what could be a natural occurrence within the characteristic landscape.

WATERSHED. A total area of land above a given point on a waterway that contributes runoff water to the flow at that point. Sensitive watershed is an area with fragile geologic, soil, or vegetative conditions, where small changes in the intensity of land use can cause large changes in erosion rates.

WETLANDS. Permanently wet or intermittently flooded areas where the water table (fresh, saline, or brackish) is at, near, or above the soil surface for extended intervals, where hydric wet soil conditions are normally exhibited, and where water depths generally do not exceed two meters.

WITHDRAWAL. An action that restricts the use of described public lands from operation of certain laws, which are also described in the withdrawal order. Withdrawal also may be used to transfer jurisdiction or management to other federal agencies.

1.0 PROPOSED ACTION AND ALTERNATIVES

1.1 INTRODUCTION

Ark Land Company, St. Louis, Missouri, has filed an application with the Bureau of Land Management (BLM) to obtain a coal lease on approximately 4,145.15 acres of federal coal lands located in the Carbon Basin area. Ark Land Company, through its affiliate, Arch of Wyoming, Inc., (Arch) has conducted coal mining operations in the Hanna Basin Region of Carbon County since 1972. The depletion of recoverable coal reserves in the Hanna Basin has led Arch to identify additional (local) coal resources in the Carbon Basin area that could utilize the existing infrastructure and meet existing contracts and/or long-term commitments. The Carbon Basin area is in close proximity to the Hanna Basin coal fields and provides a logical continuation of the Hanna Basin mining operations.

In 1982, a federal coal lease was issued for approximately 60% of the federal coal lands located in the Carbon Basin. Because this lease was still in effect at the time the current BLM land use plan (the Great Divide Resource Area Resource Management Plan-RMP-1990) covering the Carbon Basin area was prepared, it was exempt from the coal screening/planning requirements. However, development of this lease was never pursued and the lease expired in 1992. Also at the time the Great Divide RMP was prepared, there was no other interest expressed by industry in obtaining federal coal leases in the area. As a result of these two factors, the coal screening/planning process was not conducted on the area and there were no coal planning decisions for any of the federal coal lands in the Carbon Basin area included in the Great Divide RMP.

1.2 PURPOSE AND NEED

The Federal Coal Leasing Amendments Act of 1976 requires that federal coal lands to be considered for leasing must be identified in a comprehensive land use plan. Because no coal planning decisions were made for the Carbon Basin coal area in the Great Divide RMP a planning review, which includes conducting the coal screening/planning process and an environmental analysis, must be completed and documented, before the BLM can consider leasing federal coal in the Carbon Basin. The Ark Land Company coal lease application, or any future applications to lease coal in the Carbon Basin, cannot be given consideration until a planning review is conducted on the federal coal lands involved and a determination is made that some or all of the lands are open to consideration for coal leasing and development.

This environmental assessment (EA) documents the results of the planning review conducted to determine if the federal coal lands with coal development potential in the Carbon Basin planning review area should be open to consideration for coal leasing and development. If necessary, the Great Divide RMP will be amended. Federal regulations that provide guidance for amending land use plans are found at 43 CFR 1610.5-5. The Carbon Basin planning review area is shown in Figure 1.1.

1.2.1 DESCRIPTION OF THE PLANNING REVIEW AREA

As provided by the Federal Land Policy and Management Act (FLPMA), the BLM has the responsibility to plan for and manage the public lands. As defined by FLPMA, the public lands are those federally-owned lands, and any interest in the lands (e.g., federally-owned mineral estate), that are administered by the Secretary of the Interior, specifically through the BLM. Within the planning review area, there are varied, intermingled, and overlapping land surface and subsurface mineral ownerships. Therefore, the administrative jurisdictions for land use planning and for managing the land surface and minerals are also

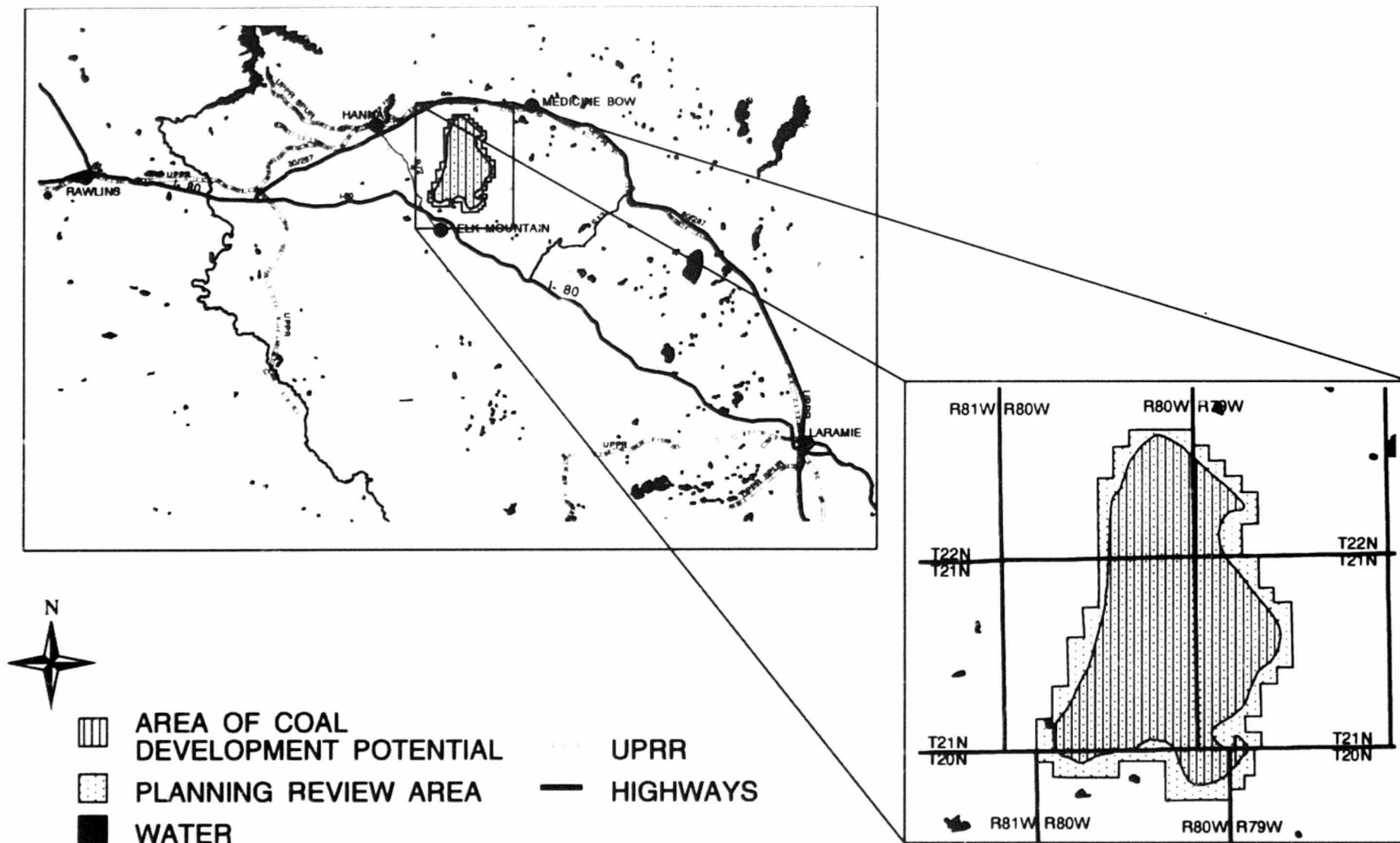


Fig. 1.1 CARBON BASIN PLANNING REVIEW AREA LOCATION MAP

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varied, intermingled, and overlapping. Figure 1.2 shows surface and mineral ownerships in the planning review area.

Because of this situation, the Coal Planning Decisions which may be made as a result of this document for the Carbon Basin area will not include planning and management decisions for lands or minerals within the planning review area that are privately owned or owned by the State of Wyoming or local governments. It is not within BLM's jurisdiction to provide direction for the surface or minerals management of these lands. Table 1.1 summarizes the land surface and mineral ownerships and administrative relationships for the area.

TABLE 1.1

LAND AND MINERAL OWNERSHIPS AND ADMINISTRATIVE JURISDICTIONS WITHIN THE CARBON BASIN PLANNING REVIEW AREA

<u>Areas the Carbon Basin Planning Decisions WILL Cover:</u>	<u>Approximate Acres</u>
A. Areas where the land surface and mineral estate are both federally owned and are both administered by the BLM	7,410.54
B. Areas where the land surface is federally owned and administered by the BLM and the mineral estate is owned by private individuals, the state of Wyoming, or local governments	0.00
C. Areas where the land surface is owned and administered by private individuals, the state of Wyoming, or local governments and the mineral estate is federally owned and administered by the BLM	4,707.82
Total BLM administered federal mineral estate to be covered under the Carbon Basin Planning Review Decisions (acres)	12,118.36
<u>Areas the Carbon Basin Planning Decisions WILL NOT Cover:</u>	
D. Areas where the land surface and minerals are both owned by private individuals, the state of Wyoming, or local governments and the BLM has no administrative authority	26,341.57
Total land surface acres in the Carbon Basin Planning Review Area (all ownerships)	38,459.93

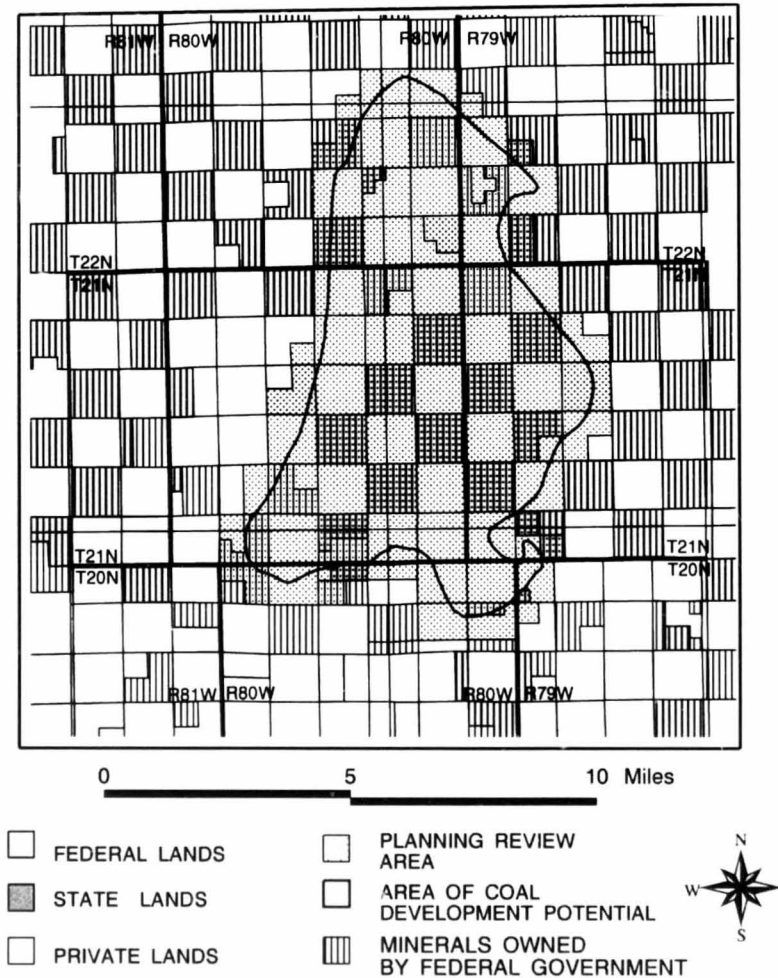


FIG. 1.2 CARBON BASIN PLANNING AREA SUBSURFACE MINERAL/OWNERSHIP STATUS MAP

1.3 PLANNING ISSUES, CRITERIA, AND OBJECTIVES

1.3.1 INTRODUCTION

The Carbon Basin planning review area is within the area covered by the Great Divide RMP. The planning issues and planning criteria which were used to develop the RMP and which are applicable to the Carbon Basin are summarized in Appendix 2. Management objective decisions described in the Great Divide RMP which apply to the Carbon Basin planning review area are outlined in Appendix 5. This provides an overview of those issues and concerns that were addressed in developing the RMP and that were also considered in this planning review. Scoping issues and concerns and specific planning issues regarding potential future coal development in the Carbon Basin area and the planning criteria for developing coal planning decisions for the area are presented below.

1.3.2 SCOPING ISSUES AND CONCERNS

The following issues and concerns were identified by the public, BLM, and other governmental organizations during scoping for the planning review and for the proposed coal development in Carbon Basin by Ark Land Company. These issues and concerns were considered during development of planning issues for this plan review. Other issues specific to the Ark Land Company proposal, such as proposed coal hauling routes, are beyond the scope of this planning document and will be addressed during environmental impact statement (EIS) preparation for the Ark Land Company lease application or future coal lease applications, should the Decision Record for this EA find the area, or some portion of the area, acceptable for coal development and further leasing consideration.

1.3.3. KEY ISSUES

- Cumulative impacts
- Social and economic effects on local communities
- Surface and groundwater impacts
- Direct and indirect wildlife habitat loss
- Effects on big game winter range and migrations
- Effects on threatened, endangered, candidate, and state sensitive species and their habitats
- Noise impacts
- Effects on cultural resources and Native American spiritual values and compliance with applicable laws and Executive Orders
- Air quality impacts
- Effects of No Action Alternative
- Impacts to the Medicine Bow River and Seminole Reservoir

1.3.4. OTHER ISSUES AND CONCERNS

- Effects on visual resources and aesthetics
- Noxious weed control
- Effects on highly erodible and unstable soils
- Effects on wetlands, waters of the U.S., riparian areas, and alluvial valley floors
- Effects on paleontological resources
- Effects on current and future land uses
- Impacts to existing pipelines
- Impacts to existing water rights

- Impacts to other mineral resources and conflicts with other mineral or energy development proposals
- Reclamation standards and procedures
- Adequacy of data used in the coal screening process
- Mine subsidence
- Impacts on recreational opportunities
- Integration of coal screening process with environmental analysis

1.3.5. PLANNING ISSUES

Three planning issues were developed from the scoping issues and concerns.

1.3.5.1 Issue 1: Coal Mining Activities Affecting Resource Values

Issue 1 centers around the conflicting demands for consumptive and nonconsumptive uses of resources in the Carbon Basin area and around the idea that some resource uses are not compatible. The planning area contains public lands and multiple resources for which there are demands for development or use. The development or use of coal, oil and gas, other minerals, livestock grazing, and wind energy should be managed in a manner that ensures resource use conflicts and impacts to other resource values are minimized. The basic challenge is protecting resource values such as watershed, water quality, vegetative cover, soils, air quality, recreation, and wildlife habitat while allowing extraction of federal coal reserves. Which areas of federal coal in the planning area are acceptable for further consideration for leasing and development?

How will conflicts between coal mining and other activities in the Carbon Basin be addressed?

What management practices or use restrictions are needed to maintain or improve wildlife habitat, especially high priority habitat, and to provide adequate habitat to support featured species? At what sites in the Carbon Basin will these management practices or restrictions be required?

What management practices or use restrictions should be applied to protect essential habitat for threatened, endangered, or sensitive wildlife and plant species? In what parts of the Carbon Basin should these practices be required?

What development activities and management practices should be allowed on wetland/riparian and aquatic habitat, and when should they be allowed?

What management practices are needed to reduce accelerated soil erosion?

What conditions of use should be applied to activities that cause or have the potential to cause adverse effects on surface and subsurface water quality and quantity?

Where would management practices or use restrictions not be sufficient to protect sensitive resources?

1.3.5.2 Issue 2: Resource Accessibility

Issue 2 relates to public lands and resources that are isolated or difficult to access (i.e., legal and physical access) and difficult to manage. The intermingled land and mineral ownership pattern in the planning review area is instrumental in this concern. Sometimes state and privately-owned lands can be affected as well. For example, if private coal were developed in the planning area and adjacent federal coal lands were not available for leasing, the federal coal reserves could be bypassed at significant economical loss and waste

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of the coal resource. It would be inefficient and uneconomical to attempt to extract the bypassed coal at a later date. Returning to mine a previously mined area would also unnecessarily compound and duplicate adverse environmental impacts in the area.

Which areas of federal coal in the planning area are acceptable for further consideration for leasing and development.

1.3.5.3 Issue 3: Social and Economic Considerations

Issue 3 relates to the community stability or sustainability and the effect that coal mining or other development activities have on the local economy. Any decision to consider all or part of the Carbon Basin acceptable or unacceptable for further leasing consideration will affect local infrastructure and economic activity in the county and region.

How will the decision to lease or not lease federal coal affect local communities and the county?

1.3.6. PLANNING CRITERIA

The Federal Coal Management Program established four major steps to be used in the identification of federal coal areas acceptable for coal development. Collectively these four steps are referred to as the "coal screening/planning process" and include: (1) identification of coal development potential, including a call for resource information (43 CFR 3420.1-2); (2) application of the coal unsuitability criteria (43 CFR 3461); (3) multiple-use conflict evaluation [43 CFR 3420.1-4(e)(3)]; and (4) surface owner consultation.

During the planning review, these four steps were applied to federal coal lands in the Carbon Basin area. A complete explanation of how the coal screening process was conducted and how the results were applied for each alternative in this EA is included in the Coal Appendix, Appendix 1.

Additionally, RMP planning criteria that are applicable to actions occurring, or expected to occur, within the Carbon Basin were considered during the planning review. Planning criteria are the constraints or ground rules that are developed to guide and direct the development of the RMP. Those RMP planning criteria that are applicable to the Carbon Basin are presented in Appendix 2, Great Divide Resource Management Plan - Planning Issues and Criteria and Appendix 3, Wyoming BLM Mitigation Guidelines.

During the planning review effort, other federal agencies, state and local governments, Indian tribes, and other publics were consulted as specified in 43 CFR 3420.1-6, 1-7.

1.4 COMPLIANCE WITH THE NATIONAL ENVIRONMENTAL POLICY ACT

In compliance with the National Environmental Policy Act (NEPA), and with the Council on Environmental Quality (CEQ) regulations implementing the Act, this EA documents the Carbon Basin coal planning review. The purpose of the EA is to provide the decision makers and the public with sufficient information to understand how the planning review was conducted and the broad environmental impacts that may result from anticipated coal mining within the Carbon Basin area.

NEPA compliance for subsequent aspects of the federal coal program (i.e., leasing and mining) does not end with the land use planning decision. If all or part of the federal coal lands in the planning review area are found to be acceptable for further leasing consideration, an EIS will be prepared for the Ark Land Company coal lease application. That is, the land use planning decision stating that federal coal lands are

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"acceptable for further leasing consideration" is literal. It is a prerequisite to "considering" the issuance of a federal coal lease but is not a decision to issue a lease. The subsequent EIS or EA for a coal lease application is the basis for making a leasing decision.

Further, if it is decided to lease the federal coal, a lease is not simply issued to an applicant. Rather, a lease sale is held. A federal coal lease sale is based on competitive, sealed bids. The successful bidder must not only submit the highest bid but the bid must equal or exceed an undisclosed amount determined by the BLM as the fair market value. While the EIS or EA based decision to lease the federal coal lands is a necessary prerequisite for mining federal coal, it is not in itself the enabling action that will allow mining. Prior to mine development the lessee will file a permit application package with the Wyoming Department of Environmental Quality (WDEQ) which includes mining and reclamation plans supported by extensive baseline data. This package is reviewed by federal agencies including the Office of Surface Mining (OSM) and BLM. If after review the application complies with the Mineral Leasing Act of 1920, NEPA, and other federal laws and regulations, WDEQ will issue the applicant a permit to conduct coal mining operations. OSM reviews the permit application package and recommends approval, approval with conditions, or disapproval of the mining plan to the Assistant Secretary of Interior, Lands and Mineral Management. Federal and State permits required prior to mining are listed on Table 1.2.

1.5 PUBLIC PARTICIPATION AND CONSULTATION

In addition to this EA, other public involvement activities and consultations were conducted during the planning review process, including the following:

Governor's Consultation. The BLM Wyoming State Director notified the Governor of Wyoming on December 6, 1996, that a coal lease application had been filed with BLM.

Public Notice. BLM filed a public notice on November 18, 1996, announcing that a coal lease application had been received and requesting public comment. A notice was published in the Federal Register on November 22, 1996. In November, 1996 a scoping statement was mailed to government agencies, municipalities, Native American tribes, grazing permittees, lease operators, industry representatives, environmental organizations, and other agencies and individuals having a potential interest in the proposed project. The scoping statement explained the proposed project and requested comments regarding issues and concerns that should be addressed during the environmental analysis process. Both the Federal Register notice and the scoping statement identified that required environmental analyses and this planning review may result in an amendment to the Great Divide RMP.

Scoping meetings were held in Hanna, Laramie, and Rawlins, Wyoming on December 3, 4, and 10, respectively. Thirty-four written comments were received (Table 1.3). Those comments that are applicable to this EA were considered during the planning review.

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**TABLE 1.2
FEDERAL AND STATE PERMITTING REQUIREMENTS AND AGENCIES**

Agency	Lease/Permit/Action
FEDERAL	
Bureau of Land Management	Coal Lease Resource Recovery and Protection Plan Scoria Sales Contract Exploration Drilling Permit Right-of-Way grants Contract for sale of mineral materials
Office of Surface Mining	Mining Plan Approval SMCRA oversight
Mine Safety and Health Administration	Safety Permit and Legal I.D.
Bureau of Alcohol, Tobacco, and Firearms	Explosives Manufacturer's License Explosives Use and Storage Permit
Federal Communication Commission	Radio Permit: Ambulance Mobile Relay System Radio License
Nuclear Regulatory Commission	Radioactive By-products Material License
Army Corps of Engineers	Authorization of Impacts to Wetlands and Other Waters of the U.S.
Environmental Protection Agency	Hazardous Waste I.D. Number
Department of Transportation	Hazardous Waste Shipment Notification
Federal Aviation Administration	Radio Tower Permit
STATE	
State Land Commission	Coal Lease Scoria Lease
Department of Environmental Quality, Land Quality Division	Permit and License to Mine
Department of Environmental Quality, Air Quality Division	Air Quality Permit to Operate Air Quality Permit to Construct

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TABLE 1.2 (continued)

Agency	Lease/Permit/Action
Department of Environmental Quality, Water Quality Division	NPDES Water Discharge Permit Permit to Construct Sedimentation Pond Authorization to Construct Septic Tank and Leach Field Authorization to Construct and Install Public Water Supply and Sewage Treatment
Department of Environmental Quality, Solid Waste Management	Solid Waste Disposal Permit-Permanent Construction
State Engineer's Office	Appropriate Surface/Groundwater Permits
Industrial Siting Council	Industrial Siting Certification of Non-Jurisdiction
Department of Health	Radioactive Material Certification of Registration

**TABLE 1.3
LIST OF COMMENTORS**

CITIZENS GROUPS

Biodiversity Associates/Friends of the Bow Medicine Wheel Coalition	Carbon County Coalition Wyoming Outdoor Council
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GOVERNMENT AGENCIES

Federal

U.S. Army Corps of Engineers, Omaha District Office	U.S. Bureau of Reclamation
U.S. Army Corps of Engineers, Wyoming Regulatory Office	U.S. Fish and Wildlife Service

State

Department of Transportation	Office of the Governor
State Historic Preservation Office	Wyoming Game and Fish Department
Wyoming State Engineers' Office	Wyoming State Geological Survey

Other

Carbon County Chamber of Commerce	Carbon County School District No. 1
Carbon County Economic Development Corporation	Carbon County School District No. 2

TABLE 1.3 (continued)

INDIVIDUALS

T. Joe Bromby	Mike Chiropolos	John Howard	Craig Jones
Hope Jones	Mark Ledder	Jason Lillegraven	Barbara Parsons
Phil Reinbold	Robert Scherer II	Jack Tlustos	Susan Tlustos
Tim Tlustos	Tony Tlustos		

INDUSTRY

Carbon Power and Light Inc.	Louisiana-Pacific Corporation
Pacific Power	

NATIVE AMERICAN TRIBES

Oglala Sioux Tribe

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2.0 ALTERNATIVES INCLUDING THE PREFERRED

2.1 INTRODUCTION

Section 2.1.1 describes the land use and resource management alternatives that were analyzed in detail. The other alternatives and management options that were considered but not analyzed in detail are described in Section 2.1.2.

Alternative 1, the No Action alternative, would continue present management direction in the Carbon Basin planning review area, as provided by the planning and management decisions in the Great Divide RMP, with consideration for other reasonably foreseeable development and land use activities. Under this alternative, none of the federal coal lands within the Carbon Basin area would be open to coal development or further consideration for coal leasing.

Under alternative 2, the BLM's preferred alternative, the maximum amount federal coal lands available in the Carbon Basin area would be open to coal development and further leasing consideration. This alternative represents the result of conducting the first two steps of the coal screening/planning process in the planning review area (i.e., identifying the federal coal lands in the area with development potential and applying the coal unsuitability criteria on those lands). This alternative provides for mitigation of impacts and enhancement of resource values while surface-disturbing activities (e.g., coal mining) would be allowed.

In conducting the third step of the coal screening process (other multiple-use conflicts analysis) on Alternatives 1 and 2, no conflicts with potential development of the federal coal were identified that warrant development of additional alternatives (see Chapter 4-Environmental Consequences, and the Coal Appendix).

2.2 ALTERNATIVES CONSIDERED IN DETAIL

2.2.1 ALTERNATIVE 1: NO ACTION-CONTINUATION OF PRESENT MANAGEMENT

This alternative would continue present management practices and direction identified in the Great Divide RMP. Under this alternative, the federal coal lands in the Carbon Basin planning review area would be closed to coal development and further leasing consideration. Other existing uses of the BLM-administered public lands in the area would continue and mining of state and privately-owned coal in the area would occur.

The following are descriptions of those activities likely or anticipated to occur in the planning review area over the next 20 years. An additional description of existing public land and resource uses in the area is found in Chapter 3-Affected Environment.

2.2.1.1 Cultural Resources Management

Prior to conducting surface disturbing activities in the planning review area, class I, II, or III cultural resource inventories would be conducted for surface disturbing actions involving BLM-administered public lands or minerals. Cultural sites identified as significant would be stabilized and protected. Other cultural sites may be excavated to obtain the cultural information they contain before they are disturbed.

2.2.1.2 Paleontological Resources Management

Prior to conducting surface disturbing activities in the planning review area, inventories would be conducted on a case-by-case basis to insure integrity of the scientific value of paleontological resources.

2.2.1.3 Fire Management

The planning review area would continue to be managed as a full suppression area. There would be no fire suppression equipment restrictions.

2.2.1.4 Lands and Realty Program Management

All BLM-administered public lands within the planning review area would be open to consideration for placement of utility or transportation systems with regard for potential coal development or other activities on private land. To the extent possible, such systems would be located next to existing facilities.

The BLM-administered public lands in the planning review area would be open to consideration for disposal, if disposal is consistent with the objectives of the RMP. The preferred method of disposal would be exchange. Given the fact that the BLM knows the extent of the coal resource, any patent issued for public lands within the planning review area would reserve at least the coal and possibly all minerals to the United States.

SeaWest Energy Corporation holds a right-of-way (ROW) grant and proposes to develop the Simpson Ridge area over a 10-12 year period beginning in 1998. A portion of the Simpson Ridge windpower project area overlaps the planning review area (see Figure 2.1). Approximately 430 MW of electricity would be generated from the Simpson Ridge area by 575 - 715 turbines placed in strings of varying length. Associated facilities would include transformers, buried electrical and communication lines, roads, substations, and above-ground powerlines from the substations. The pace, direction, and even the ultimate size of development within Simpson Ridge area is not known because of uncertainty associated with the impending deregulation of the electric utility industry.

2.2.1.5 Livestock Grazing Management

Livestock grazing use in the planning review area would continue. Livestock grazing would be managed to provide for protection or enhancement of other resource values.

The current amounts, kinds, and seasons of livestock grazing use would continue to be authorized until monitoring indicates a grazing use adjustment is necessary. The total authorized livestock grazing use would not exceed the recognized active preference in the planning review area (maximum of approximately 5,489 animal unit months of annual forage use).

2.2.1.6 Minerals Management

Leasable Minerals

Coal

The federal coal lands in the Carbon Basin area would be closed to consideration for coal development and leasing. None of the federal coal in the area would be leased or developed. However, coal mining would occur in the general area as state and privately-owned coal reserves are developed.

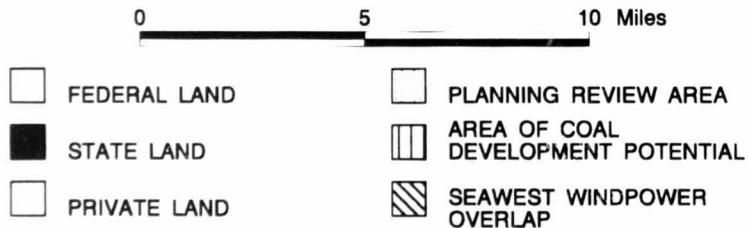
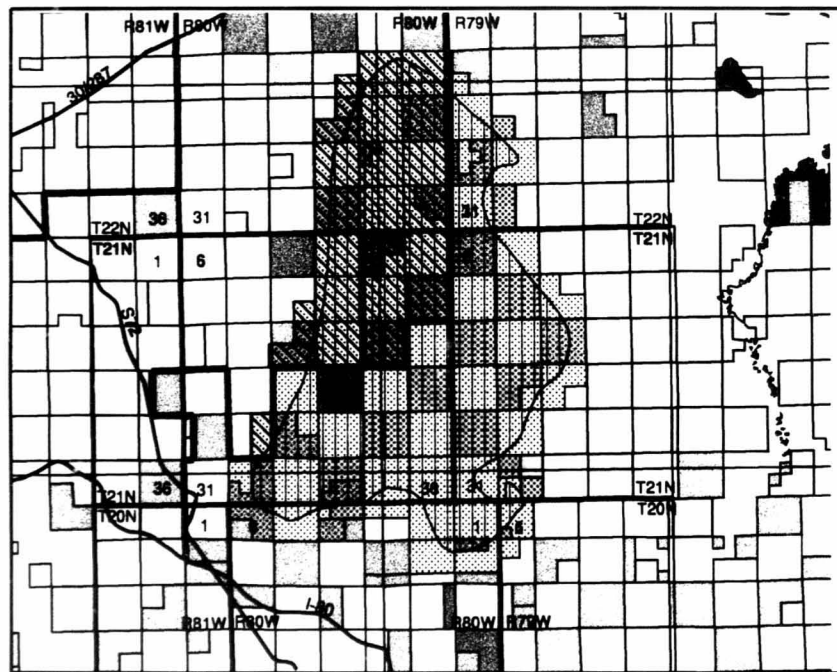


Fig. 2.1 CARBON BASIN PLANNING AREA
AND SEAWEST PROJECT OVERLAP AREA

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It is reasonable to expect that as much as 2,700 acres of private/state surface would be disturbed and 25 million tons of private/state coal would be removed. The federal surface and federal coal lands are not the dominant land ownership in the planning review area. Eighty-one percent of the land surface within the area is privately owned. Known private/state coal reserves total about 79 million tons of coal recoverable by surface mining methods and 498 million tons of coal available for extraction using underground mining methods. This accounts for 65% of the total coal reserve base in the planning review area.

Oil and Gas

The planning review area would be open to federal oil and gas leasing and to geophysical exploration activities. Federal leases and exploration permits would be issued with restrictions to protect other resource values.

Locatable Minerals

The planning review area would be open to location of mining claims and mineral development except for areas that are closed and withdrawn from mineral location.

All locatable mineral actions would be reviewed to assure compliance with the BLM bonding policy for surface disturbing activities.

Salable Minerals

The planning review area would be open to consideration for the sale of mineral materials (e.g., sand, gravel) on a case-by-case basis, with appropriate stipulations to protect other resource values.

2.2.1.7 Recreation Management

Dispersed recreational opportunities such as hunting, sightseeing, and hiking within the planning review area would continue where legal public access exists. All or portions of three sections of BLM administered public land are legally accessible.

The planning review area would be open to travel by over-the-snow vehicles provided they do not adversely affect wildlife or vegetation. All other motorized vehicle use in the planning review area would be limited to existing roads and trails.

2.2.1.8 Soil, Water, and Air Management

Watershed management practices would be carried out and designed to meet soils, water, and air resource management objectives. Surface disturbing activities would be prohibited on unstable areas unless it can be demonstrated that the instability can be alleviated. Specific unstable areas such as landslides and slumps would be identified individually.

Intensive land-use management practices needed to mitigate salt and sediment loading caused by surface-disturbing activities would be identified on a case-by-case basis and implemented on Second and Third Sand Creeks.

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2.2.1.9 Visual Resource Management

The northern third of the planning review area would be managed as a Class III area (approximately 13,500 acres) and the southern two-thirds of the planning review area would be managed as a Class IV area (approximately 25,000 acres).

2.2.1.10 Wildlife Habitat and Fisheries Management

The planning review area is within the Saratoga Valley Habitat Management Plan and management would be implemented to improve wildlife habitat. Wildlife and habitat inventory and monitoring would be implemented in the planning review area.

The Wyoming BLM Mitigation Guidelines (Appendix 3) would be used to identify and develop mitigation needs to protect areas important to wildlife. When considering needs for protective measures, the Wyoming Game and Fish Department (WGFD) would be consulted concerning proposals involving surface disturbance or wildlife disruption within the planning review area.

Big game crucial winter range within the planning review area would be protected and the quality of overlapping crucial winter range would be maintained.

Sage grouse strutting and nesting habitat would be protected.

Chapter Three, Affected Environment, identifies in greater detail the existing natural resources and uses in the planning review area.

2.2.2 ALTERNATIVE 2 (also the BLM preferred alternative): FEDERAL COAL LEASING AND DEVELOPMENT ALTERNATIVE.

This alternative would differ from Alternative 1 by opening the planning review area to consideration of federal coal leasing and development. Optimal resource management would continue to be achieved by balancing land and resource use activities with intensive management and conditional requirements, including such things as limitations, restrictions and other mitigation requirements.

All of the resource uses and terms and conditions of use described in the No Action-Continuation of Present Management alternative would occur under this alternative. Only the following description of management of the federal coal resource and the related requirements differs from the Minerals Management-Leasable Minerals-Coal section of Alternative 1.

2.2.2.1 Minerals Management

Leasable Minerals

Coal

12,088.36 acres of federal coal lands containing approximately 313 million tons of coal in the Carbon Basin area would be open to consideration for coal development and leasing. The likely development scenario over the twenty year analysis period is that the southern portion of the basin would be developed first using surface coal mining techniques. Including availability of federal coal under this alternative would add approximately 5.4 million tons of federal coal and 200 acres of surface disturbance to public lands to the reasonably foreseeable development of private/state surface mining described in Alternative 1.

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Coal reserves with potential for underground mining would be evaluated to determine if they could be economically recovered. It is a standard mining practice to access underground coal reserves from the final highwall that remains after all economically recoverable surface reserves have been extracted. Underground mining would likely extract coal at a rate of three to five million tons per year. Additional surface disturbance as a result of underground mining is difficult to determine because most of the impact would be related to subsidence. Additional surface disturbance associated with the underground mining operations may occur if additional mine and ancillary facilities are required.

If all surface minable coal reserves within the planning review area are mined at some point in the future, an estimated 7,000 total acres in all ownerships (1,200 acres public land surface and 5,800 acres private state) would be disturbed. This amounts to approximately 18% of the 38,459 acres in the planning review area.

As a result of the coal screening process the following conditional requirements and/or mitigation measures would be applied to surface disturbing activities associated with mining and development of the federal coal in the Carbon Basin area.

For concerns with cultural resources management: In order to preserve the historic setting surrounding the Town of Carbon Cemetery, 120 acres of federal coal lands would be open to consideration for further leasing and development for subsurface mining methods only. Surface occupancy and surface disturbance on this area would be prohibited.

For concerns with paleontological resources management: If paleontological resources, either large and conspicuous and/or of significant value are discovered during construction, the find will be reported to the authorized officer immediately. Construction will be suspended within 250 feet of said find. An evaluation of the paleontological discovery will be made by a BLM-approved paleontologist within five (5) working days, weather permitting, to determine the appropriate action(s) to prevent the potential loss of any significant paleontological value. Operations within 250 feet of such discovery will not be resumed until written authorization to proceed is issued by the authorized officer. The lessee will bear the cost of any required paleontological appraisals, surface collection of fossils, or salvage of any large conspicuous fossils of significant scientific interest discovered during the operations.

For concerns with the lands and realty management program: Existing roads and/or ROWs for powerlines and pipelines would be relocated to accommodate coal mining and related activities. Areas within existing ROWs would be open to coal leasing and development, subject to valid existing rights and negotiations for relocating pipelines and powerlines, if necessary. Prior rights would be protected for all ROWs of record. Any unforeseen conflicts in the planning review area would be identified and resolved during the coal leasing process or during development of mining and reclamation plans.

Surface or subsurface coal mining and surface related activities would be prohibited on federal coal lands within a 100-foot buffer zone around cemeteries and a 300-foot buffer around occupied structures. Should conflicts arise, it would be the responsibility of the lessee to show that the conflicts between mining activity and the buffer zone would be adequately addressed and mitigated to the satisfaction of both parties. These situations, if they arise, would be addressed during the course of processing federal coal lease applications and prior to issuing any federal coal lease.

Because mining in the planning review/windpower project overlap area may not occur in the near future, and because placement of wind energy facilities or coal mining activities cannot be determined at this time, BLM has placed the following provision in the wind energy ROW grant:

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Federal coal resources underlie a portion of the Simpson Ridge Windpower Project Area. To prevent federal coal resources from being devalued by surface improvements, the grant holder may place wind energy facilities on the public lands identified below, but bears the responsibility for repair, replacement, or lost revenue should the BLM subsequently lease federal coal and the mining of such coal damage or impair the operation of wind energy facilities. The lands subject to this condition are:

T. 21 N., R. 80 W.

Section 12: All

Section 14: All

T. 22 N., R. 80 W.

Section 22: NE $\frac{1}{4}$, S $\frac{1}{2}$

Section 26: N $\frac{1}{2}$ NW $\frac{1}{4}$, SW $\frac{1}{4}$ NW $\frac{1}{4}$

Section 34: All

For concerns with oil and gas management: Conflicts could arise where 8,634.64 acres of federal oil and gas leases overlap federal coal areas open to consideration of coal development and leasing. To allow for full development of both resources, current BLM policy (see Coal Appendix), including use of appropriate lease stipulations, would be used to resolve any conflicts that arise between oil and gas development and coal development.

For concerns with soil, water, and air management: Riparian habitat and wetland areas would be open to consideration of coal development and leasing. During the mine permitting process, it may be determined that some drainages would be best avoided, while short reaches of other drainages would be diverted around mine pits and held in temporary channels and/or ponds.

In potential alluvial valley floors and adjacent areas, where coal mining could interrupt or intercept water flow to farming areas along drainages, mining of federal coal would be allowed only with appropriate mitigation measures made part of an approved mine plan or permit.

For concerns with wildlife habitat and fisheries management: All federal coal lands that are open to consideration for leasing and development would be subject to continued field investigations, studies, and evaluations to determine if certain methods of coal mining can occur without having a long-term impact on wildlife, in general, and on threatened and endangered species and their essential habitats.

Required surveys for prairie dog complexes would be included in the stipulations for any federal coal lease that may be issued in the area. Any area found to support an endangered species would be acceptable for coal development with a provision that any federal coal lease issued would include a requirement for developing appropriate mitigation measures that would protect the long-term interests of the species and habitats involved. The USFWS has recommended that if black-tailed prairie dog colonies or complexes greater than 79 acres or white-tailed prairie dog colonies or complexes greater than 200 acres would be disturbed, surveys for black-footed ferrets should be conducted.

Prior to leasing federal coal, surveys would be completed for bald and golden eagle roosts and nests, falcon cliff nesting sites, and birds protected under the Migratory Bird Treaty Act.

A Biological Assessment (BA) would be prepared in conjunction with the EIS or EA that is prepared prior to issuing federal coal leases. As a result of the BA, EIS or EA, other stipulations may be identified, to the effect that the lessee would be required to develop mitigation measures or habitat improvement,

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development, or reclamation plans to the satisfaction of the BLM and U.S. Fish and Wildlife Service (USFWS). Mitigation measures may include but would not be limited to such things as seasonal operations in some areas, buffer zones around occupied nests (e.g., eagles, falcons), protection of active (not necessarily occupied) nests at all times (unless otherwise provided by USFWS), on or off site (but on lease) habitat improvement or development, special reclamation measures, or other appropriate measures for long-term habitat protection.

Mitigative measures would be combined with appropriate mining methods to reduce impacts of mining in antelope and deer crucial winter ranges within the planning review area in order to maintain a long-range balance between habitat needs and coal development.

Grouse habitat areas would be open to coal development with stipulations and mitigation requirements for habitat maintenance, improvement, development and reclamation. Exploration activities and ancillary facilities would be allowed provided that (1) the surface disturbing activities related to exploration and ancillary facility development avoid the lek and 1/4 mile distance from the lek area, if possible, and where not possible, intensive mitigation were applied; (2) permanent and high profile structures, such as buildings, overhead powerlines, other types of high profile ancillary facilities, etc., were prohibited in the lek and a 1/4 mile distance from the lek area; (3) during the grouse mating season, surface uses and activities were prohibited between the hours of 6:00 p.m. and 9:00 a.m., within 1/2 mile of the leks; (4) if surface disturbance in the nesting area within a 2 mile distance of a lek were limited to only actual mining activity and other activities were subject to seasonal limitations; and (5) if it were attempted to relocate lek and nesting complexes that are disturbed or destroyed by coal mining (relocation efforts are to be coordinated with the BLM, WGFD and other appropriate state agencies).

2.3 ALTERNATIVES CONSIDERED BUT NOT ANALYZED IN DETAIL

2.3.1 NO FUTURE COAL DEVELOPMENT IN THE CARBON BASIN AREA.

This alternative was considered as a means of identifying current (baseline) environmental impacts occurring within the planning review area. This alternative was dropped from further consideration as unrealistic due to the inability of the BLM to control what activity occurs on private/state land.

2.3.2 NO EXCEPTIONS - STRICT APPLICATION OF THE COAL UNSUITABILITY CRITERIA WITH NO APPLICATION OF EXCEPTIONS.

This alternative was considered as a potential "protection alternative." Under this alternative all federal coal lands within the Carbon Basin planning review area would be found unsuitable under the coal unsuitability criteria and would be eliminated from further consideration for leasing or development. Because the No Action - Continuation of Present Management alternative adequately addresses no leasing or development of federal coal, this alternative was dropped from further consideration.

3.0 AFFECTED ENVIRONMENT

3.1 INTRODUCTION

This chapter describes existing conditions of cultural, physical, biological, and socio-economic resources in the planning review area.

Past environmental analyses have revealed that the following Critical Elements of the Human Environment are either not present in the planning review area or will not be affected: areas of critical environmental concern, sole-source drinking water, prime or unique farmlands, threatened and endangered or candidate plant species, and state sensitive plant species of concern, wild and scenic rivers, or wilderness. In addition to the above critical elements of the human environment that are not affected, the following elements are also not affected: forest management, wild horses, and fire management.

A wild and scenic river review of BLM-administered public lands was conducted as part of this planning review. No BLM-administered public lands crossed by waterways or segments of waterways in the planning review area meet the wild and scenic rivers eligibility criteria. Thus, no BLM-administered public lands in the review area will be given further consideration for inclusion in the wild and scenic rivers system (See Wild and Scenic River Review-Appendix 4).

3.2 GENERAL SETTING

The Carbon Basin is situated between the Great Divide Basin to the west and the Laramie Plains to the east. The basin is characterized by open, rolling terrain at elevations between 6,900 feet and 7,400 feet above sea level. The Carbon Basin is a shallow basin separated from the Hanna Basin by the Simpson Ridge anticline. The planning review area is located about five to six miles northeast of the town of Elk Mountain and eight miles southeast of the town of Hanna in Carbon County. The area is sparsely populated, however, there are scattered ranching operations throughout the planning review area and adjacent areas along the Medicine Bow River.

The Carbon Basin is 38,459.93 acres in size. Landownership consists of various combinations of surface and mineral ownerships (See Table 1.1). The planning review area contains 12,118.36 acres of federal coal lands of which 4,707.82 acres are split estate. Other lands include 24,261.57 acres of private surface and subsurface estate and 2,080.00 acres of state coal lands.

The climate of southcentral Wyoming and the planning review area is characterized by dry air masses, which are modified Pacific air masses moving eastward over the Rocky mountains. Westerly winds provide most of the precipitation, and is a result of thunderstorms occurring in March, April and May. Stable atmospheric conditions occur 80% of the time because of cold temperatures and moderately strong winds (USDI, 1979). Temperatures in the area average about 45 degrees Fahrenheit annually with summer highs of 89 degrees Fahrenheit and winter lows of 0 degrees Fahrenheit or below. Winds are generally out of the southwest and west for much of the year, with an average wind speed of 11 miles per hour (USDI, 1979).

3.3 AFFECTED RESOURCES AND LAND USES

3.3.1 CULTURAL RESOURCES

A file search with the Wyoming State Historic Preservation Office, Office of Cultural Records, shows that 117 archeological sites exist within the boundaries of the planning review area. Of these sites, 30 have been determined to be eligible for listing on the National Register of Historic Places, 35 have not been evaluated for National Register eligibility, and the remainder are not eligible for National Register listing.

Site types include historic period ranches such as the T.L. Ranch (48CR1475), historic period mines (48CR1475, 48CR4105), the town of Carbon (48CR426), the Fort Halleck Road (48CR3649), the Overland Trail (48CR932), and the Transcontinental Railroad (48CR5772). Prehistoric period sites include rock shelters (48CR3986, 48CR394, 48CR1492, 48CR1493), bison kill sites (48CR939), and stone circle sites (48CR334, 48CR1482).

Information received from the Northern Arapaho Tribe identified the region as one containing many sites of traditional importance. One site that may be important to Native American traditions has been recorded in the planning review area. This site, 48CR460, has been identified as a rock alignment/medicine wheel.

3.3.2 NATIVE AMERICAN VALUES

While concerns may be voiced by the general public during the public scoping period, the unique legal status of American Indians, the sovereignty of tribal governments, and the nature of reserved tribal rights merit separate attention. The Carbon Basin Planning Area of Wyoming may contain sites and locales which some of today's Indian tribes could find significant because of an association with tribal history or because of a site's traditional religious or cultural importance to the tribe. Such sites are generally deeply rooted in the tribe's history and are important in maintaining the continuing cultural identity of the tribe.

These sites and locales may be merely natural features such as specific springs or unusual geologic formations which are sacred to a tribe. They may also be observable man-made features such as rock cairns, stone circles, medicine wheels, or other rock alignments generally found on high places, or pictographs or petroglyphs. All of these types of sites and locales may have been used historically by a tribe for religious purposes or may still be used by a tribe's traditional practitioners. There may also be trails or specific locales where historic events have occurred which are of importance to a tribe's history. Finally, tribal members and traditional practitioners may traditionally use a particular locale for gathering and collecting materials, such as medicinal plants or minerals, used for important cultural or religious activities. Traditional gathering areas may, therefore, also be of concern to an Indian tribe.

Physical affects on a cultural or historical resource should not be the only consideration. Because sites and locales significant to a tribe may be used for religious purposes, which usually require prayer and meditation, effects from auditory and visual impacts must also be considered.

Procedures for identifying sites and locales of concern to Native Americans requires consultation with the appropriate tribal government or with traditional practitioners of the tribe. While some places may come to light through the conduct of archaeological or historical surveys, the existence and significance of locations of concern often can be ascertained only through interviews with knowledgeable Native American users of the area, or through other forms of ethnographic research. Executive Order No. 13007, Indian Sacred Sites, requires that in managing federal lands, each executive branch agency with statutory or administrative responsibility for management of federal lands shall, to the extent practicable, permitted by law, and not

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clearly inconsistent with essential agency functions (1) accommodate access to and ceremonial use of Indian sacred sites by Indian religious practitioners and (2) avoid adversely affecting the physical integrity of such sacred sites.

In complying with Executive Order No. 13007 and identifying all other Native American concerns, the BLM will follow procedures and guidance established in BLM Manual Handbook H-8160-1, General Procedural Guidance for Native American Consultation.

3.3.3 PALEONTOLOGICAL RESOURCES

Important fossil records of the Hanna and Carbon Basins are well-known (USDI 1987:106, 1992). Two known localities occur in or immediately adjacent to the planning review area; one is in the Wind River Formation on the eastern slope of Foote Creek Rim (Hayden 1966); the other is in the Medicine Bow Formation and contains scraps of a limb bone. There are no other known fossil localities within the planning review area, but several of the rock formations outcropping in the area are known to have high potential to produce scientifically important fossils.

3.3.4 LANDS AND REALTY PROGRAM

Land ownership is primarily a checkerboard pattern of alternating federal and private ownership. State school sections also occur within the planning review area.

There are numerous prior land use authorizations for the public lands within the planning review area. Land authorizations within the area include ROW's granted for roads, pipelines, power and telephone lines, wind generation, and fiber optic cables. ROW holders in the planning review area include:

- Carbon Power and Light Company
- Colorado Interstate Gas Company
- Commissioners of Carbon County
- Northern Gas Company of Wyoming
- Amoco Pipeline Company
- Wyoming Interstate Company, LTD
- Williams Natural Gas Company
- Witel, Inc.
- Wyoming Department of Transportation
- SeaWest Energy Corporation

The Simpson Ridge area, located on the west side of the planning review area, has a potential for wind energy development. This area (approximately 55,000 acres) is generally located in the north half of Township 21 N., R. 80 W. and all of Townships 21 N., R. 81 W. and T. 22 N., R. 80 W. A more exact description can be found in the KENETECH/PacificCorp Windpower Project EIS (USDI, 1995). Approximately 12,800 acres of the Simpson Ridge Wind Energy Project Area overlaps the planning review area.

SeaWest Energy Corporation (who acquired development rights from KENETECH Windpower through bankruptcy court) proposes to develop the Simpson Ridge area over a 10-12 year period, beginning in 1998. Approximately 430 MW of electricity would be generated from the Simpson Ridge area by 575-715 turbines placed in strings of varying length. Associated facilities would include transformers, buried electrical and communication lines, roads, substations, and above ground powerlines from the substations. The pace, direction, and even the ultimate size of development within the Simpson Ridge area is not known because of uncertainty associated with the impending deregulation of the electric utility industry.

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Other wind energy development may occur outside of Simpson Ridge by other companies. The location, pace, and number will be influenced by the success of the SeaWest project, stability of electric prices, demand, and lowered cost of wind generation.

3.3.5 LIVESTOCK GRAZING

Two grazing allotments are partially within the planning review area; the North Anschutz Allotment and the Chace Block Allotment.

The North Anschutz Allotment contains 31,157 acres (13,021 acres federal, 16,296 acres private, and 1,840 acres state) and 5,981 animal unit months (AUM) of forage. Approximately 46% of the acres and 44% of the AUMs (5,112 acres and 914 AUMs federal, 8,032 acres and 1,485 AUMs private, and 1,240 acres and 223 AUMs state) are within the planning review area. Grazing use on the allotment involves two operators.

The Chace Block Allotment contains 65,850 acres (15,151 acres federal, 44,169 acres private, and 6,530 acres state) and 10,345 AUMs of forage. Approximately 24% of the acres and 28% of the AUMs (2,040 acres and 372 AUMs federal, 13,228 acres and 2,350 AUMs private, and 840 acres and 145 AUMs state) are within the planning review area. Grazing use on the allotment involves three operators.

3.3.6 MINERALS RESOURCES

3.3.6.1 Geology

The Carbon Basin is a relatively shallow geologic basin separated from the Hanna Basin to the west by Simpson Ridge, a sharply folded, asymmetric anticline. The Tertiary Hanna Formation, which is exposed at the surface in the Carbon Basin, unconformably overlies the Lewis Shale and the Medicine Bow and Ferris Formations. Potentially minable coals of the Carbon Basin are found in the Hanna Formation. Rocks within the Hanna Formation are extremely variable, containing everything from massive, cross-bedded conglomeratic sandstones to shales, claystones, and coals. The coarser grained, more massive strata are interpreted to be fluvial in origin. The finer grained sediments are thought to be overbank deposits laid down during flood events.

3.3.6.2 Coal

The first commercial development of coal in the Carbon Basin was near the town of Carbon in 1868. By 1888 the major coal mining interest in the area shifted to near the town of Hanna. However, several companies operated in the southwest portion of the Carbon Basin between the 1920s and the 1950s. Edison Development Company held a Federal coal lease on much of the Carbon Basin from 1982 to 1992. No development took place under this lease.

Recent interest has been expressed in mining the southern portion of the planning review area where geologic exploration has accurately defined the coal resource. The northern portion of the planning review area was the first area developed for coal in the 1880's. Only easily accessible coal seams were developed. Little geologic exploration has been conducted in the northern portion of the basin, however, the probability exists that the coal seams of economic interest in the southern half of the planning review area also occur in the northern half of the basin.

Geologic information indicates that the most economically attractive coal for surface mining (generally under 0 to 200 feet of overburden) is found along the margin of the coal development potential area. The coal beds dip inward toward the center of the basin at approximately 11 to 16 degrees and extend to depths of

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approximately 900 feet (USDI, 1979). Because of the dip, overburden above the coal beds rapidly increases to a point where surface mining methods become uneconomical and the coal can only be recovered using underground methods of extraction.

Estimates of shallow coal reserves and resources, 0 to 200 feet of overburden, in the Carbon Basin are presented in Table 3.1 (Glass and Roberts, 1979). Coal quality information for the basin is given in Table 3.2 (Glass and Roberts, 1979). Estimates for deep (underground mining methods) coal reserves in the Carbon Basin lack precision because of the scarcity of drilling information. Drilling information is almost non-existent for the northern portion of the planning review area. Conservative estimates of coal reserves for coal within 200 to 1,000 feet of the surface have been estimated at 768 million tons (Glass and Roberts, 1980).

**TABLE 3.1
SHALLOW COAL RESERVES
OF THE CARBON BASIN**

Coal Seam	Reserve Base (million tons) from 0-200 feet	Inferred Resources (million tons) 0-200 feet	Avg. Thickness (feet)
Carbon No. 6	1.06		5.94
Bed 109	12.86		5.89
Bed 105	2.01		5.00
Finch	15.64	2.69	8.04
Carbon No. 4	0.44		10.10
Johnson Rider	17.37		9.55
Johnson	68.60		13.66
Carbon No. 5	0.88		8.36
Total	118.86	2.69	

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**TABLE 3.2
COAL QUALITY
CARBON BASIN**

Coal Seam	BTU/lb	Sulphur (%)	Ash (%)	Moist. (%)
Carbon No. 6	8705	2.30	14.27	10.25
Bed 109	7580	2.50	34.50	8.70
Bed 105	N/A	N/A	N/A	N/A
Finch	11450	0.50	8.74	9.88
Carbon No. 4	10560	0.54	10.40	10.53
Johnson Rid	N/A	N/A	N/A	N/A
Johnson	11280	0.60	11.27	11.00
Carbon No. 5	10540	0.33	11.27	10.02

Three mines, the Medicine Bow, Seminole No. 2, and Shoshone No. 1 Mines, are currently producing coal in the Hanna Basin. Arch of Wyoming operates the Medicine Bow and Seminole No. 2 Mines. Together these mines are permitted for a maximum production rate of five million tons per year. Under their current rate of production Arch estimates that minable reserves will be depleted by 1999. Ark Land Company submitted an application for a federal coal lease to the BLM's Wyoming State Office in September 1996 stating their intent to mine coal reserves in the Carbon Basin.

Cyprus Shoshone Coal Corporation (CSCC) mines coal from the Shoshone No. 1 Mine, an underground longwall mining operation in the Hanna Basin. This mine is permitted to produce three million tons of coal per year. CSCC intends to expand their current operation by mining additional tonnage at the north end of their permit boundary.

Three other mines, the Rosebud Coal Sales' Rosebud Mine, and Arch's Seminole No.1 and Energy Development Company mines, are currently being reclaimed and no additional mining is anticipated from these operations.

3.3.6.3 Oil and Gas

In the past several federal oil and gas leases have been issued within the planning review area. At this time 12 federal oil and gas leases containing 8,634.64 acres of federal mineral land are currently active. The existing federal oil and gas leases represent a pre-existing right. Any subsequent coal mining operations on federal lands would not interfere with the economic recovery of federal oil and gas resources from existing leases except as determined by BLM. One section containing federal minerals in Section 20, T.21 N., R.80 W. is located within the boundary of the Simpson Ridge oil and gas field.

There is one producing well within the planning review area located on private surface/private mineral land in Section 9, T. 21 N., R. 79 W. No wells are currently located on federal coal lands in the planning review

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area and there are no outstanding applications to drill. Three of the twelve existing federal oil and gas leases in the planning review area are due to expire before 1998 and all others are due to expire prior to the year 2000.

3.3.6.4 Locatable Minerals

No locatable minerals (e.g., precious metals, bentonite) are known to exist in the planning review area in sufficient quantities for economical recovery. There are no mining claims located within the planning review area.

3.3.6.5 Salable Minerals

Salable minerals within the planning review area include sand, stone, gravel, clay, and scoria. Sand and gravel are being excavated from deposits near Simpson Ridge and along the Medicine Bow River (Harris and Meyer, 1986). Terrace sand and gravel deposits occur at the northern end of Foote Creek Rim and immediately west of Foote Creek Rim, and other recoverable deposits of sand, gravel, stone, scoria, and/or clay may occur in isolated deposits throughout the planning review area.

3.3.7 RECREATION VALUES

Hunting opportunities in the planning review area include prairie dogs, sage grouse, antelope, deer, rabbits, and coyotes. Public access to the planning review area is limited; the few existing roads are used by hunters to access approximately 1100 acres of publicly accessible BLM-administered land and 480 acres of State land. Private lands are only accessible with permission from the landowner.

The old townsite and cemetery of Carbon are occasionally visited during the summer months by those interested in the history of the area.

3.3.8 SOIL, WATER, AND AIR RESOURCES

3.3.8.1 Soil Resources

Soils in the planning review area are highly variable due to topography and geology. In general, topographic features within the planning review area can be grouped into four main classes.

The first distinct topographic grouping consists of moderately steep to steep residual uplands with sharp ridge crests and slope breaks. These areas typically support very shallow to shallow loams to fine sandy loams with high erosion potentials.

The second major topographic classification consists of rock outcrops in a badland-type topography. Soils in these areas are typically very shallow and have very high erosion potentials.

The third classification consists of gently sloping to moderately steep residual uplands. These areas tend to support soils that are shallow to moderately deep loams to sandy clay loams with moderate erosion potentials.

The fourth major classification consists of gently sloping to moderately steep slopes on alluvial fans, terraces, and drainage bottoms. These areas support soils that are typically deep loam to clay loam soils with low to moderate erosion potentials.

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All of the four topographic groups and the associated soils are found throughout the planning review area. Many of the soils in the planning review area have salty subsoils and moderately low to low bearing strength when wet.

3.3.8.2 Water Resources

Surface Water

The Carbon Basin planning review area falls within three watersheds: Carbon Creek watershed drains approximately 15% of the area, First Sand Creek watershed drains approximately 25% of the area and Second Third Sand Creek watershed drains approximately 60% of the area. Figure 3.1 shows the location of watersheds in the planning review area. Carbon Creek flows into Smith Reservoir (overflow from Smith Reservoir could flow into Allen Lake). First Sand Creek also flows into Allen Lake, a closed basin at the northeast corner of Carbon Basin. Second and Third Sand Creeks merge before flowing into the Medicine Bow River. Ephemeral streams in the coal lease area have deep arroyo type channels with flat sand beds and nearly vertical banks.

All streams in the planning review area are ephemeral and generally flow less than 15 days per year (based on information from the USGS gaging station on Third Sand Creek located in Section 28, T. 21 N., R. 79 W.). The maximum known peak discharge of 1,560 cubic feet per second (cfs) was confined to the channel. There is a 10% chance that the maximum discharge of Third Sand Creek in any given year will exceed 1,200 cfs and a 50% chance that the maximum discharge will exceed 320 cfs.

Springs and seeps are present in the planning review area. Also, several small dams, stock ponds and other structural improvements for surface water are located within the area. There are several water diversion impoundment structures on Second Sand Creek. Two intermittent lakes (playas) exist on the southern edge of the lease area boundary.

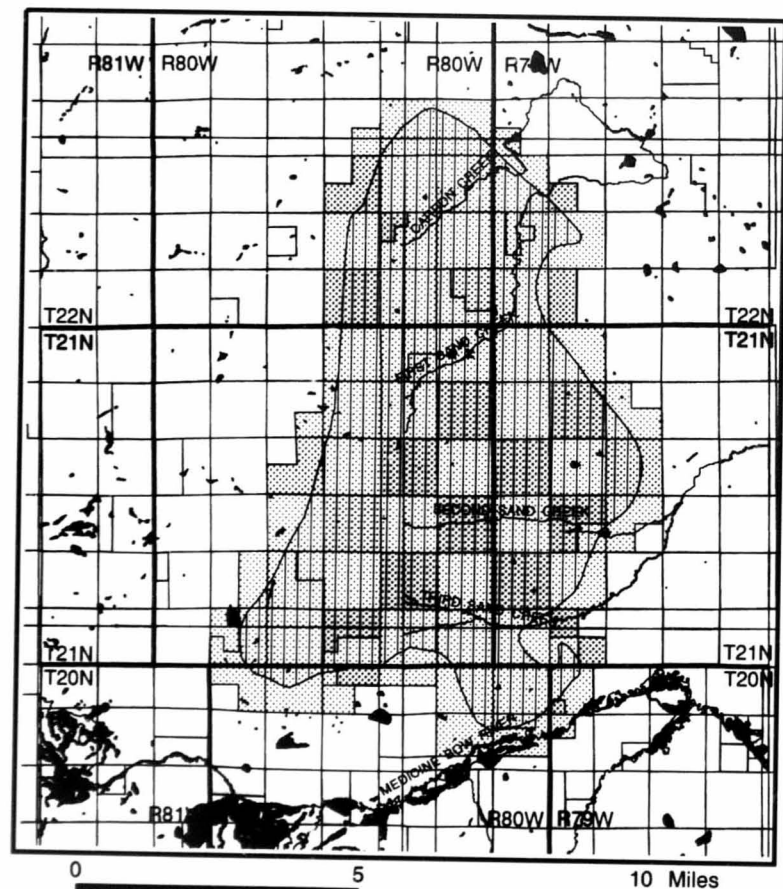
Surface water quality for waters for Third Sand Creek and Second Sand Creek were tested by Mesilla Valley Engineers in 1978. The pH of waters in both Sand Creeks ranged from 7.9 to 8.4; TDS ranged from 788 milligrams per liter (mg/l) on Third Sand Creek in April 1978 to 2,700 mg/l in Second Sand Creek in May 1978. The waters were high in calcium, magnesium and sulfate. The water is acceptable for wildlife, livestock and irrigation.

No sediment analyses were made for flows resulting from intense summer precipitation events. No new information has been obtained that indicates a change in surface water characteristics since this study was conducted. These summer flows would probably carry sediment loads of several thousand mg/l.

Groundwater

Groundwater exists in three aquifer types within the Carbon Basin: alluvial, water table (including some perched zones), and artesian (confined). Along drainage channels of the ephemeral streams there are narrow deposits of quaternary fluvial alluvium that contain water. The level of the groundwater in the alluvial fill fluctuates in direct response to the surface flow.

The coal beds are overlain with sandstones, siltstones, and shales of the Hanna Formation. The sandstones immediately above the coal are generally saturated with water and form localized aquifers. Where clays overlie the saturated sandstone, artesian conditions can exist. Where the aquifer approaches outcrops toward its recharge area, water table conditions exist. The coal beds and adjacent sand and shale



- | | | | |
|--|--------------|--|------------------------------------|
| | FEDERAL LAND | | PLANNING REVIEW AREA |
| | STATE LAND | | AREA OF COAL DEVELOPMENT POTENTIAL |
| | PRIVATE LAND | | WETLANDS DATA |

Fig. 3.1 CARBON BASIN PLANNING REVIEW AREA WETLANDS MAP

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layers are an unproductive multi-aquifer system. Although coal is a relatively poor aquifer, delivering only a few gallons per minute (gpm), it is the principle aquifer in the planning review area.

Groundwater studies, conducted for the initial Carbon Basin coal mining proposal in 1978, focus on the four sections where surface mining was originally proposed (Section 1, T. 20 N., R. 79 W., Sections 29 and 30, T. 21 N., R. 79 W., Section 35, T. 21 N., R. 80 W.). The studies were based on five wells with depths of 60 to 70 feet below the Johnson coal bed. Data from these wells indicate that most of the overburden was relatively dry and that water yield would be minimal.

Groundwater in the four sections initially proposed for surface mining was tested and evaluated by Mesilla Valley Engineers in 1978. The total dissolved solids (TDS) concentrations ranged from 672 to 8,084 mg/l in over four sampling periods in 1978. Water having TDS concentrations of greater than 1,000 mg/l is unacceptable for human consumption. Water from all wells had a strong hydrogen sulfide odor. Water would generally be suitable for livestock and wildlife consumption; however, some analyses indicate marginal suitability because of high cadmium, copper, iron, and zinc.

Water Use

Water rights exist for stock ponds, irrigation diversions, and groundwater wells. Principle use of water is for livestock watering and for wildlife. Irrigation use is minimal.

3.3.8.3 Air Resources

The Carbon Basin planning review area is located within the Laramie Air Basin, which is designated as a Prevention of Significant Deterioration (PSD) Class II area under the WDEQ Air Quality Division Implementation Plan. PSD areas are those that may be developed with an increased concentration of pollutants over the ambient levels. The maximum levels of pollutants allowed are defined by the National Ambient Air Quality Standards. Coal mining is not currently affected by PSD regulations because surface coal mines are not one of the 28 EPA listed (Sections 111 and 112 of the Clean Air Act of 1977) major emitting facilities for PSD regulations. Unless a large processing facility is located at the mining site, point source emissions from surface coal mining will rarely exceed the 250 ton criterion (USDl, 1983).

The primary air quality pollutant in Wyoming is total suspended particulates (TSP). Fugitive dust from natural sources, unpaved roads, coal mines, road construction, and other surface disturbing activities increase the ambient levels of TSP. No violations of TSP Class II air quality standards are known to occur in the planning review area and the air quality in the region is considered good. Conditions in the planning review area are good for dispersion of pollutants because neutral conditions with associated high wind speeds occur more than 70% of the time.

The nearest Class I area (Savage Run Wilderness) is 30 miles south-southwest of the Carbon Basin and is not in the direction of the prevailing winds.

3.3.9 VISUAL RESOURCES

The planning review area includes lands designated Visual Resource Management (VRM) Class III and Class IV. Visual resource management classes define the degree of acceptable visual change within a characteristic landscape. A class is based on the physical and sociological characteristics of any given homogeneous area and serves as a management objective. Further explanation of the Visual Resource Contrast Rating System is available in BLM Manual 6320. Class III areas occur where changes in any of

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the basic elements (form, line, color, or texture) caused by management may be evident in the characteristic landscape. However, the change should remain subordinate to the visual strength of the existing character. Class IV areas occur where changes may subordinate the original composition and character; however, changes should reflect what could be a natural occurrence within the characteristic landscape.

The land within the planning review area consists of rolling terrain covered with low growing sagebrush, mountain shrub, greasewood, and rock outcrops. The principal drainage features in the area are the Sand Creeks and Carbon Creek, which are ephemeral streams with little scenic value. The planning review area is crossed by seasonal, unimproved dirt roads and fences. These intrusions can be seen throughout the planning review area.

3.3.10 HAZARDOUS MATERIALS

A field inspection of the planning review area has not been conducted to determine the presence of any hazardous wastes or materials as defined by the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA). Potential sources of contamination, now and in the future, could include:

1. Spills or leaks from pipelines or vehicles carrying petroleum products.
2. Migration (surface and subsurface) of hazardous substances or petroleum products onto the planning review area from adjacent property.
3. Spilling, leaking, or dumping of hazardous materials or petroleum products from a highway or railroad ROW.
4. Spilling, leaking, or dumping of hazardous materials or petroleum products associated with agricultural or livestock production activities and mineral extraction operations.
5. Illegal dumping of hazardous materials or petroleum products onto the planning review area or adjacent property.
6. Other sources of contamination not currently obvious or predictable.

3.3.11 TRANSPORTATION

The planning review area can be accessed from the town of Hanna via State Highway 72 and County Road 115, from the north via State Highway 30 and County Road 115, from the south via Interstate 80 and Highway 72 and County Roads 115 and 3. Access into the interior of the planning review area is via a variety of unimproved two-track roads and trails. The Union Pacific Railroad line parallels State Highway 30 to the north of the planning review area.

3.3.12 NOISE

Wind, vehicular traffic on Wyoming Highway 30 and other roads, occasional airplanes, and recreational activities are the primary sources of noise in the planning review area. A noise survey was conducted in 1994 for the KENETECH Windpower Project EIS at the Foote Creek Rim area, six miles southeast of the planning review area. The survey results indicated the predominant noise was wind and the levels of noise are strongly correlated to wind speed. The ambient noise levels recorded were generally equivalent to a noise level of a normal conversation.

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3.3.13 VEGETATION RESOURCES

3.3.13.1 Terrestrial

The vegetative cover on the planning review area is comprised of four vegetative types. The geographic locations, acreage, and percent distribution of the vegetative types and the disturbed area caused by previous mining are shown in Figure 3.2.

The sagebrush-grass type (type 4) is the predominant vegetative type on the planning review area. It is located primarily on the shallow to moderate slopes of hills and in drainages. The vegetative composition within the type varies widely because the soils vary within the type site. This composition variance can range from a 90% shrub/10% grass and forb ratio to a 30% shrub/70% grass and forb ratio; the average is approximately 40% shrub and 60% grass and forb. The dominant shrubs include big sagebrush, rabbitbrush, and snowberry. Dominant grasses are western wheatgrass, bluebunch wheatgrass, Indian ricegrass, and bluegrass. Vegetative production of this type ranges from approximately 600 pounds to 850 pounds of air dry vegetation per acre.

The birdfoot sagewort type (type 4a) is generally located on the flat hilltops and upland flat swales. Because this type of vegetation has a low growth characteristic, the areas may appear as grasslands from a distance. Shrub composition is primarily birdfoot sagewort, shadscale, and winterfat. The dominant grass species are western wheatgrass, Indian ricegrass, and bluegrasses. Vegetative production of this type ranges from approximately 200 to 350 pounds of air dry forage per acre.

The greasewood type (type 14) is limited to the bottoms of the main drainages, primarily along Third Sand Creek and to a lesser extent on Second Sand Creek. The dominant shrub species are greasewood, big sagebrush, and snowberry. The understory cover of grasses includes Sandberg bluegrass, bottlebrush squirreltail, and various species of wheatgrasses.

The mountain shrub type (type 5) is limited in extent and is generally associated with rocky outcrops. It also occurs within the sagebrush-grass type as small isolated patches that are smaller in size than the minimum mapping unit (5 acres). Although the areas are scattered and small in size, the type is important as wildlife habitat since it contains species preferred by wildlife; the dominant shrub species are mountain mahogany, big sagebrush, snowberry, and rabbitbrush. The understory cover of grasses includes Indian ricegrass, wheatgrasses, and bluegrasses.

3.3.13.2 Riparian/Wetland/Aquatic

Within the planning review area there are four drainages: Carbon, First, Second, and Third Sand Creeks. All four drainages are classified as intermittent/ephemeral and do not support fish populations of any kind. Figure 3.1 shows potential wetland areas mapped by the U.S. Fish and Wildlife Service. These areas are mapped from aerial photography and must be confirmed by on-the-ground surveys as jurisdictional wetlands.

The major river drainage in the area is the Medicine Bow River which lies in the southeast corner of the planning review area on private land and represents a potential alluvial valley floor (AVF). The river supports a substantial riparian community. Approximately two linear miles of cottonwood riparian vegetation is present within the planning review area. The overstory riparian vegetation in this area consists of coyote willow, cottonwood trees, and some waterbirch.

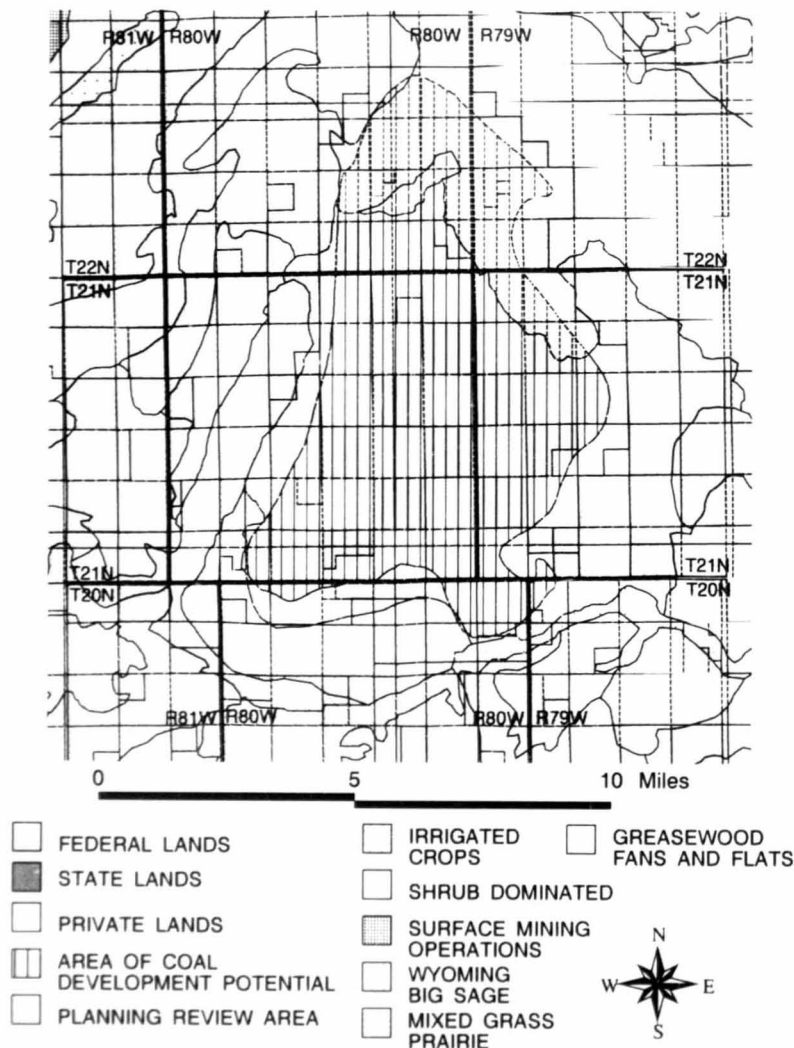


Fig. 3.2 CARBON BASIN PLANNING AREA VEGETATION TYPES

ENVIRONMENTAL ASSESSMENT - Carbon Basin Area

3.3.13.3 Noxious Weeds

There have been no noxious weed inventories conducted in the planning review area. Although no noxious weeds have been documented as occurring within the planning review area, it is highly likely that they do occur.

3.3.14 WILDLIFE/FISHERIES HABITAT AND THREATENED AND ENDANGERED SPECIES

3.3.14.1 Wildlife Habitat

Big Game

The planning review area provides habitat for two big game species: pronghorn antelope and mule deer. The area provides critical habitat (crucial winter range) for pronghorn and mule deer.

The pronghorn in this area are part of the Medicine Bow herd. Seventy-two percent of the planning review area is pronghorn crucial winter yearlong range (Figure 3.3). The remaining 28% of the planning review area is pronghorn spring-summer-fall range, which is generally used between May 1 and November 30. The timing of seasonal movements and the extent to which crucial winter yearlong range is used are dependent on weather and snow depth (Yoakum, 1978; Guenzel, 1986; Deblinger, 1988). Pronghorn select winter habitat based upon the density and height of sagebrush. Sagebrush shrubland and greasewood vegetation types cover most of the planning review area.

Mule deer from the Sheep Mountain herd unit occupy the planning review area. The entire planning review area is winter yearlong range for this herd with approximately 20% of the area crucial winter yearlong range (Figure 3.3). Mule deer tend to use low elevation sagebrush habitat with less snow depth and less snow cover during the winter. Based on general seasonal movement patterns, mule deer generally migrate onto crucial ranges within the planning review area from the south although specific mule deer movements are unknown. In severe winters mule deer move out of the planning review area and move into the Medicine Bow River area. Thirteen percent (5,000 acres) of the planning review area falls within an overlap zone of both mule deer and antelope winter range.

The planning review area is outside the elk range and is considered unimportant to elk. Elk crucial winter range exists south of I-80.

Non-Game Mammals

Predator species that might be found in the planning review area include: coyote, red fox, swift fox, black bear, raccoon, long-tailed weasel, mink, badger, striped skunk, mountain lion, and bobcat.

Other mammals that may also be found are desert cottontail, white-tailed jackrabbit, Wyoming ground squirrel, thirteen-lined ground squirrel, and white-tailed prairie dog. Some of the rodents that may occur in the project area are northern pocket gopher, olive-backed pocket mouse, deer mouse, Ord's kangaroo rat, beaver, western harvest mouse, white-footed mouse, northern grasshopper mouse, bushy-tailed woodrat, western jumping mouse, and porcupine. Several species of bats (big brown, hoary, and the little brown myotis) may also occur.

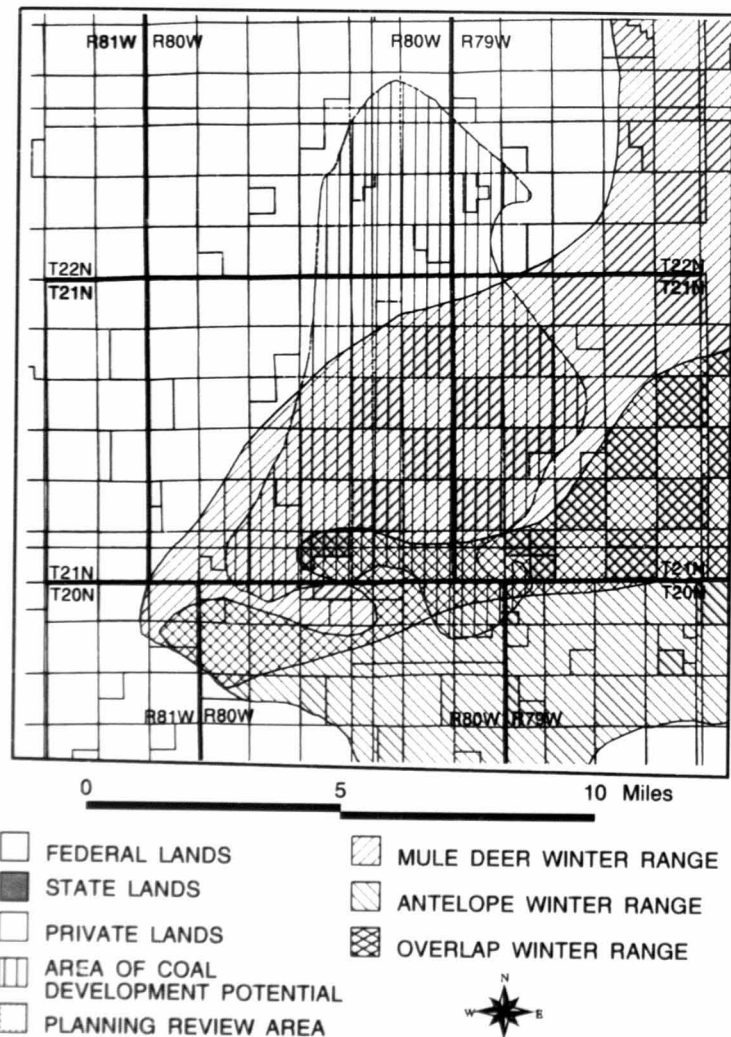


Fig. 3.3 CARBON BASIN PLANNING AREA CRUCIAL WINTER RANGE

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3.3.14.2 Game Birds

Sage grouse are the only upland game birds found in the project area. Sage grouse habitat is characterized by an interspersed mixture of sagebrush and grassland. During the winter, sage grouse use tall, dense stands of sagebrush on windblown sites that remain relatively free from snow. Low sagebrush and grass-dominated sites are used for feeding. During the spring, sage grouse gather on breeding grounds, known as leks, which are characterized by open, low-growing vegetation surrounded by denser stands of sagebrush. Sage grouse return to these areas year after year but the location may shift slightly between years. A majority of the planning review area is probable sage grouse nesting habitat (Figure 3.4).

Waterfowl species commonly-observed within the planning review area include mallard, Canada goose, northern pintail, American widgeon, and lesser scaup, among others.

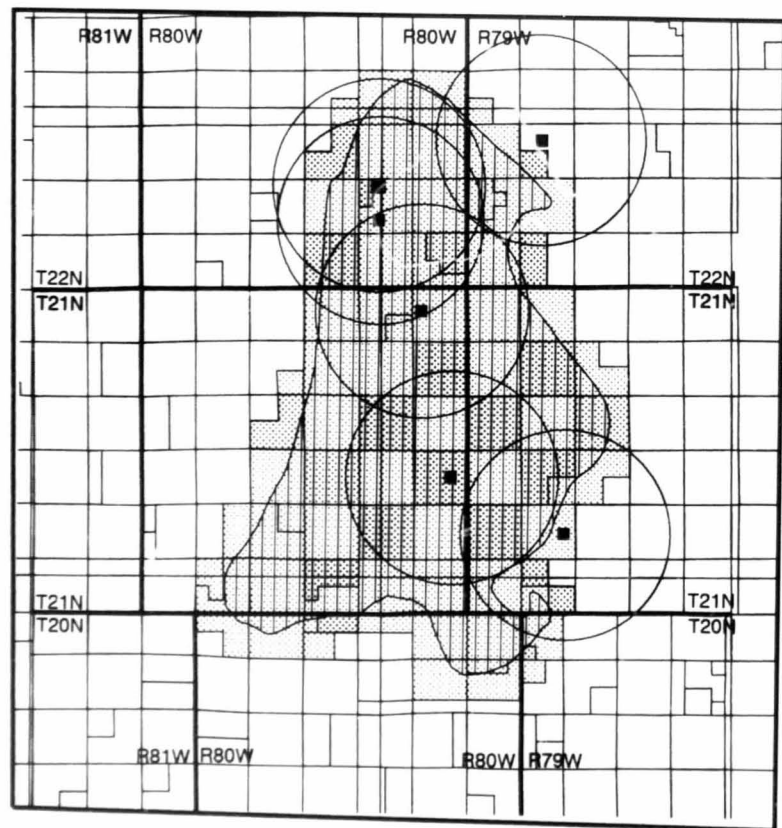
3.3.14.3 Non-Game Birds

Passerine surveys conducted for the Simpson Ridge portion of the windpower project (and overlaps some of the planning review area) found the horned lark to be the most commonly observed species. Other common species identified include mountain bluebird, cliff swallow, Brewer's blackbird, vesper sparrow, green-tailed towhee, sage thrasher, black-billed magpie, northern flicker, Brewer's sparrow, western meadowlark, American robin, tree swallow, and yellow warbler. All of these species likely occupy the remainder of the planning review area as well.

Raptor populations in the planning review area include: golden eagle, red-tailed hawk, Swainson's hawk, ferruginous hawk, American kestrel, prairie falcon, northern harrier, and turkey vulture (Figure 3.5). Most raptors are located in topographically diverse areas consisting of numerous rock outcrops, riparian zones, and cliffs. All raptors and their nests are protected from take or disturbance under the Migratory Bird Treaty Act and Wyoming Statute (W.R.S. 23-1-101, 23-3-101, and 23-3-108 and Chapter LII, Sect. 4 of the Wyoming Game and Fish Regulations). Certain species are afforded protection under the Bald Eagle Protection Act and the Endangered Species Act. The Hanna Raptor Concentration Area (RCA) is adjacent to the planning review area to the west and may contribute to a higher nest density in this area. RCAs are areas where raptor nesting densities are greater than for surrounding areas. While RCAs do not have any regulatory or planning stipulations associated with them, the BLM recognizes that surface disturbance and human activity can upset stable raptor populations. Therefore, disturbance of raptor habitat and disturbance to the birds themselves is reduced through intensive management restrictions and mitigation to reduce physical disturbance within the RCA.

3.3.14.4 Fisheries

The only known fisheries habitat is located on private land in the southeast corner of the planning review area. The Medicine Bow river is classified as a Class 4 stream; and WDEQ Class 2 surface water. Wyoming Game and Fish Department (WGFD) Class 4 streams are considered low production trout waters that may be fisheries of local importance, but are generally incapable of sustaining substantial fishing pressure (WGFD, 1991). Drainages in the project area include Carbon, First, Second and Third Sand Creeks. These creeks are either intermittent or ephemeral streams that do not support fish populations. Sevenmile Lake is a reservoir located on private property just inside the southwest corner of the planning review area. The fishery potential of this reservoir is unknown.

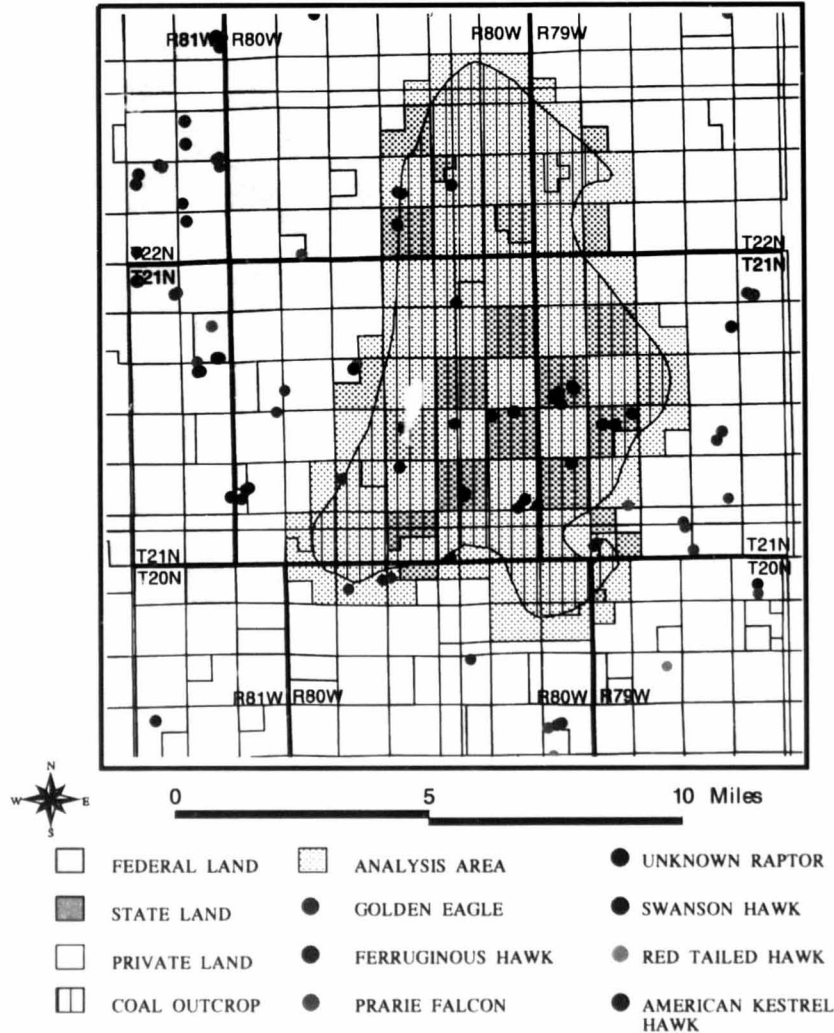


0 5 10 Miles

- | | |
|------------------------|------------------------------------|
| FEDERAL LAND | COAL BOUNDARY |
| STATE LAND | AREA OF COAL DEVELOPMENT POTENTIAL |
| PRIVATE LAND | SAGE GROUSE LEK |
| HABITAT-STRUTTING AREA | |

Fig. 3.4 CARBON BASIN PLANNING REVIEW AREA
SAGE GROUSE HABITAT/STRUTTING AREA

37



0 5 10 Miles

- | | | |
|--------------|------------------|-----------------------|
| FEDERAL LAND | ANALYSIS AREA | UNKNOWN RAPTOR |
| STATE LAND | GOLDEN EAGLE | SWANSON HAWK |
| PRIVATE LAND | FERRUGINOUS HAWK | RED TAILED HAWK |
| COAL OUTCROP | PRARIE FALCON | AMERICAN KESTREL HAWK |

Fig. 3.5 CARBON BASIN PLANNING AREA RAPTOR NEST SITES

38

3.3.14.5 Threatened and Endangered/State Sensitive Species**Threatened and Endangered Species**

There is potential for three Threatened and Endangered (T&E) wildlife species, black-footed ferret, bald eagle, and peregrine falcon to occur within the planning review area. There is also potential for two candidate species (formerly federally listed as Category 1 candidate species), the mountain plover and swift fox, to occur in the planning review area. In addition, a number of WGFD species of special concern and migratory birds of high federal interest may occur in or adjacent to the planning review area. The following narrative discusses T&E, candidate, and special species of concern/migratory birds of high federal interest that may be found in or have the potential to occur in the planning review area.

Mammals

The black-footed ferret (BFF) is the only endangered mammal that may be found in the planning review area. One probable BFF sighting was reported in August 1988, in an area along the southern border of the Simpson Ridge area (Jobman, 1992). This is the most recent potential observation of a BFF within or adjacent to the planning review area.

White-tailed prairie dogs are the primary prey for black-footed ferrets and have been observed in the planning review area and adjacent areas (Orpet survey data results).

Approximately 42% (16,160 acres) of the planning review area is classified as BFF Primary Management Zone (PMZ) 2 and is designated a secondary release site in the reintroduction of BFFs. Primary Management Zones are areas designated by WGFD, BLM, and U.S. Fish and Wildlife Service (USFWS) to assist in the management of the BFF reintroduction effort (WGFD and BLM, 1991). The area southeast of the North Platte River was declared ferret-free prior to the reintroduction of ferrets in the Shirley Basin (PMZ1). Indications are that the reintroduced ferrets have moved to the very southern portions of PMZ1 and into PMZ2. Although surveys were not required in the PMZs due to the experimental/nonessential population, the movement of the ferrets has caused the USFWS and WGFD to recommend that ferret surveys be conducted in all PMZs (personal communication with Mary Jennings, USFWS, 1997).

The swift fox, a Candidate Species, is a resident of the northern Great Plains from the Rocky Mountain foothills to Texas (Clark and Stromberg, 1987). In Wyoming, this species inhabits the eastern Great Plains grasslands, occasionally utilizing agricultural lands and irrigated native meadows. Prey items include small mammals, insects, and birds (WGFD, 1992).

No recent sightings of swift fox have been reported on or near the planning review area. However, much of the planning review area is potential swift fox habitat. Swift fox may, at least infrequently, use the planning review area and adjacent areas.

Birds

The bald eagle is a federally threatened species which requires cliffs, large trees, or sheltered canyons associated with concentrated food sources (i.e., fisheries, areas with high lagomorph populations and waterfowl concentration areas) for nesting and roosting areas (Edwards, 1969; Snow, 1973; Call, 1978; Steenhof, 1978; Peterson, 1986). Bald eagles forage widely during the non-nesting season and scavenge on animal carcasses such as deer and elk.

During 1994, one active bald eagle nest was documented approximately 2 miles south of the planning review area. It is located approximately 5 miles northwest of Elk Mountain, Wyoming, and is visible from I-80. One bald eagle successfully fledged from this nest in 1994.

The peregrine falcon is a federally endangered species. Peregrine falcons nest on tall cliffs, usually within one mile of a stream, river, or extensive brush or woodlands where such habitats provide for concentrated food sources and open areas to hunt (Call, 1978; Snow, 1972). The planning review area may occasionally be used for hunting by peregrine falcons. The Medicine Bow River and Sevenmile Lake provide a source of potential waterfowl and shorebird prey for this species. It is likely that wintering/migrating peregrine falcons also use the area on occasion.

There have been no sightings of peregrine falcons within the planning review area; however, three peregrine falcon observations were made within the Simpson Ridge area during avian surveys in August 1994.

The mountain plover is a federal candidate species inhabiting the high, dry shortgrass plains east of the Rocky Mountains (Dinsmore, 1983). The focus of breeding activity appears to be southeastern Wyoming and eastern Colorado (Graul and Webster, 1976). Graul and Webster (1976) noted that mountain plover nesting habitat is associated with blue grama and buffalo grass, although any short grass, very short shrub (e.g., saltbush), or cushion-plant type could be considered nesting habitat.

The ferruginous hawk is listed as a "species at risk," a classification formerly known as candidate 2 species. Ferruginous hawks breed in semi-arid plains and intermountain areas of the Great Basin and Great Plains (Evans, 1983). This species often nests on low cliffs, buttes, and cutbanks (Call, 1978), as well as in junipers or sagebrush along the edges of pinyon-juniper communities. Ferruginous hawks feed primarily on small to medium-sized mammals such as jackrabbits, cottontail rabbits, ground squirrels, and prairie dogs (Sherrod, 1978). Ferruginous hawk nests have been observed within the planning review area, but only a portion of the area has been surveyed and the status of these nests is unknown.

In Wyoming, the loggerhead shrike is a federal species of concern and inhabits sagebrush-grasslands associated with stands of pinyon-juniper and larger shrubs (WGFD, 1992). Although loggerhead shrike nests have not been observed in the area, it is likely that nesting occurs along the sagebrush draws and riparian areas within the project area. Most of the analysis area does provide habitat conducive to shrike foraging and hunting activities.

The western burrowing owl is classified as a "species at risk." Burrowing owls are usually active during daylight hours, feeding on insects, rodents, and birds. Burrowing owls nest in unoccupied mammal burrows, especially those of prairie dogs (Dorn and Dorn, 1990; WGFD, 1992).

The lack of recorded observations for the planning review area and surrounding region indicate that it is unlikely the burrowing owl is common to the area.

State Sensitive Species of Concern**Mammals**

There is potential for five bat species of concern to occur in the planning review area: (1) little brown myotis, (2) pallid bat, (3) small-footed myotis, (4) pale Townsend's big-eared bat, and (5) the big brown bat (personal communication, Bob Luce, WGFD, 1997). The big brown bat and the little brown myotis have been observed in the general vicinity of the planning review area. No roosts have been found for these two species within the planning review area.

Birds

Twenty Wyoming bird species of concern are known to occur or may occur in the planning review area. Ten of these species: common loon, American white pelican, white-faced ibis, tundra swan, trumpeter swan, Caspian tern, ash-throated flycatcher, scrub jay, plain titmouse, and bushy-tit have been observed but are not known to breed in the planning review area (WGFD, 1992). The snowy egret, black-crowned night heron, Forster's and black terns, northern goshawk, and Lewis' woodpecker may breed in the area (WGFD, 1992). The riparian and/or wooded habitats preferred by many of the above mentioned species are limited primarily to the Medicine Bow River corridor in the southeastern portion of the analysis area.

The long-billed curlew, a Wyoming species of concern breeds in arid grasslands and sagebrush/grasslands of the western Great Plains and Great Basin (Howe, 1983). The birds arrive in the central Rocky Mountains in April (Behle and Perry, 1975) and build shallow scrape nests in open areas of shortgrass prairie (Allen, 1980). Long-billed curlews have been observed on three separate occasions in the vicinity of the planning review area. One observation was recorded about one-half mile south of the Simpson Ridge area in 1983; the other two observations occurred in 1985 and 1987 in the vicinity of Elk Mountain (WGFD, 1994). It is likely that curlews occasionally use wetland areas within the area for foraging or as stopover areas during migration but probably remain in the area for only short periods of time. The only big body of available water is Sevenmile Lake at the southwestern corner of the planning review area. Long-billed curlew nesting activity has never been documented for the planning review area although potential nesting habitat is present.

Merlins and small falcons often nest in mature cottonwood riparian zones such as the Medicine Bow River corridor. There are no records of breeding merlins in the vicinity of the planning review area (Dorn and Dorn, 1990; WGFD, 1992). Three observations of merlins were recorded within the planning review area during the winter of 1995 (Mariah, 1994). Use of the area by this species is probably limited to fall and winter months (Dorn and Dorn, 1990). This species breeds in the spring/summer and is rare to uncommon in the winter.

There are no reptile or amphibian species of special concern that are known to occur in the planning review area.

3.3.15 SOCIO-ECONOMICS**3.3.15.1 General Information**

Wyoming's economy is based on the industries of minerals extraction, agriculture, tourism, timber, and manufacturing. In Carbon County the extractive minerals industry generates by far the greatest economic activity. In 1997, the total assessed valuation on industrial property and minerals produced in Carbon County accounted for 75.8% percent of the county's total assessed valuation (Carbon County Assessor, 1997). Since the majority of minerals are taxed a percentage of their assessed valuation, this makes the mineral industry a significant revenue base for both local and state government in Wyoming (Economic Impact of Coal on Wyoming's Economy, 1993).

Wyoming's coal industry has experienced substantial growth since the passage of the Clean Air Act in 1970, and the state has been the nation's largest coal producer for the last seven years. This growth has been an economic boost for Wyoming with the potential to further expand production levels into the next century in response to the Clean Air Amendment Act of 1990 and the low sulfur content of Wyoming's coal (Economic Impact of Coal on Wyoming's Economy, 1993).

3.3.15.2 Local Infrastructure

Local infrastructure within Carbon County, specifically Hanna, Medicine Bow, Saratoga, and Rawlins, is sufficient for the existing population. In 1990, the total population in Carbon County was estimated at 16,659. The population for communities in Carbon County in the vicinity of the planning review area are: Rawlins, 9,380; Saratoga, 1,969; Hanna, 1,076; Medicine Bow, 389; and Elk Mountain, 186 (Bureau of the Census, 1992b; Wyoming Division of Economic and Community Development, 1993).

Rawlins, located in southcentral Wyoming, is the largest community in Carbon County. It is the county seat and functions as the regional trade center for many retail services. Rawlins' economy is supported by resource development activities such as ranching, mining, and oil and gas exploration and production. Other basic economic activities in Rawlins include the operation of the State penitentiary, recreation, tourism, and retail business. Approximately 27 persons (11% of the mining related workforce) employed by the Hanna Basin coal industry, reside in Rawlins (Arch of Wyoming, 1997; Cyprus-Shoshone, 1997).

Saratoga is located about 20 miles south of Interstate 80 on State Highway 130. It is the second largest community in Carbon County, serving as the economic center for the North Platte Valley. Saratoga is also a major hunting and vacation center and has seen recent increases in property sales and community development as people from outside the county and state look to Saratoga for retirement and vacation homes. Approximately 41 persons (16% of the mining related workforce) employed by the Hanna Basin coal companies reside in the Saratoga area (Arch of Wyoming, 1997; Cyprus-Shoshone, 1997).

Hanna, located close to the Hanna Basin Coal area and about 9 miles northwest of the Carbon Basin planning review area, is heavily dependent on the coal industry. Approximately 142 persons (56% of the mining related workforce) directly employed by the coal industry, reside in Hanna (Arch of Wyoming, 1997; Cyprus-Shoshone, 1997). Many basic services are provided by local infrastructure in Hanna, however, major services are sought in both Rawlins and Laramie.

Medicine Bow, located approximately 18 miles east of Hanna on State Highway 30, is supported by a combination of mining, agriculture, and recreation. Approximately 11 persons (4% of the mining related workforce) reside in Medicine Bow (Arch of Wyoming, 1997; Cyprus-Shoshone, 1997). Medicine Bow relies on local infrastructure and services within the town of Medicine Bow and again, as in Hanna, major services are sought in both Rawlins and Laramie.

Elk Mountain, located 5 miles south-east of the planning review area, is the closest community to the planning review area. Approximately 12 persons (5% of the mining related workforce) reside in Elk Mountain (Arch of Wyoming, 1997; Cyprus-Shoshone, 1997). Elk Mountain services are limited and major services are sought in Rawlins and Laramie.

3.3.15.3 Employment and Income

The total employment for Carbon County in 1994 was 10,077 persons (Division of Economic Analysis, 1996). Total 1994 earnings in Carbon County were estimated at \$223,641,000 (Division of Economic Analysis, 1996). The top six economic sectors in the county account for 7,903 direct employees with earnings of \$183,159,000. These top six economic sectors account for nearly 79 percent of the employment and about 82 percent of the earnings for the county.

State and local government services is the largest sector from an earnings standpoint with earnings of \$40,374,000. State and local government services account for 1,747 employees, which makes them the third largest employer in the county. The second largest sector is transportation and public utilities. The

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earnings in this sector amount to \$34,611,000. With 858 employees, the transportation and public utilities sector ranks fourth in the county. The mining sector in Carbon county, which includes the oil and gas industry, is the third largest from an income perspective. This sector accounts for \$30,678,000 in income. The 674 employees in the mining sector places it sixth in terms of employment. The other services sector ranks fourth with \$27,780,000 in income, and ranks first in employment with 1,988 employees. Manufacturing follows close behind at fifth with income of \$27,143,000 and 812 employees. Among the top six, the \$22,573,000 of income generated by the retail sector ranks last, however, with 1,824 employees, retail ranks second in terms of employment. The rest of the economy is made up of agriculture, construction, wholesale trade, finance, and federal government. All of these sectors combined made up an additional 2,174 employees and \$40,482,000 of income (Bureau of Economic Analysis, 1994).

Among the top six sectors in Carbon county, the average income for mining ranks first at \$45,516.32. It is followed closely by transportation and public utilities at \$40,339.16. Manufacturing is third with an average income of \$33,427.34. Fourth is state and local government with an average income of \$23,110.48. Other services is fifth with an average income of \$13,973.84 and retail is last among the top six sectors with an average income of \$12,375.55.

In 1997 the Hanna Basin Coal mines employed a total of 253 persons. Arch of Wyoming employed 96 persons and Cyprus Shoshone Coal Corporation employed 157 persons. These figures are for direct mine employment and do not account for indirect support and service jobs within the communities of Carbon County (Arch of Wyoming, 1997; Cyprus Shoshone Coal, 1997). Using direct mine employment figures for 1995 and 1996 and data provided by the University of Wyoming, the Hanna Basin coal industry generated an estimated additional 250 jobs in the Carbon County economy (Pedersen Planning Consultants, 1997). The direct mine workforce and the additional multiplier employment generates approximately 5% of the overall Carbon County employment base.

The annual total mine salaries generate in excess of \$15 million in Carbon County each year (Wyoming Department of Employment, 1996). Other direct mine expenditures contributed an additional \$6.3 million to the economy in 1995 (Pedersen Planning Consultants, 1997). Ad valorem production, ad valorem property, and sales taxes paid by the mining industry add an additional \$4.3 million to the Carbon County economy (Pedersen Planning Consultants, 1997).

3.3.16 ENVIRONMENTAL JUSTICE

Environmental justice issues are concerned with actions that unequally impact a given segment of society either as a result of physical location, perception, design, noise, etc. On February 11, 1994, Executive Order 12898, "Federal Action to Address Environmental Justice in Minority Populations and Low-Income Populations" was published in the *Federal Register* (59 FR 7629). The Executive Order requires federal agencies to identify and address disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations (defined as those living below the poverty level). The Executive Order makes clear that its provisions apply fully to American Indian populations and Indian tribes, specifically to effects on tribal lands, treaty rights, trust responsibilities, and the health and environment of Indian communities.

Communities within Carbon County, entities with interests in the area, and individuals with ties to the area all may have concerns about the presence of a coal mine within the planning review area. Communities potentially impacted by the presence or absence of a coal mine have been identified above in the Socio-economic section of this document. Environmental justice concerns are usually directly associated with impacts on the natural and physical environment but these impacts are likely to be interrelated to social and economic impacts as well.

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Native American access to cultural and religious sites may fall under the umbrella of environmental justice concerns if the sites are on tribal lands or access to a specific location has been granted by treaty right. With regard to environmental justice issues affecting Native American tribes or groups, the planning area contains no tribal lands or Indian communities, and no treaty rights or Indian trust resources are known to exist for this area.

3.3.17 HEALTH AND SAFETY

The Memorial Hospital of Carbon County, located in Rawlins, presently has a capacity to provide medical services for a county population of 20,000 people.

Coal mining is an inherently dangerous occupation, underground mining more so than surface mining. The Mine Safety and Health Administration reports that surface mining in 1996 in the United States incurred 3.36 injuries per 200,000 man hours.

4.0 ENVIRONMENTAL CONSEQUENCES

4.1 INTRODUCTION

This chapter analyzes the impacts or potential environmental consequences that would result from the alternatives described in Chapter 2. Should it be decided to adopt Alternative 2, the Great Divide RMP would be amended to identify all, or part of the federal coal lands in the planning review area as open to consideration for coal development and leasing. The impact assessment does not describe impacts in detail. This analysis has been prepared to provide the BLM decision makers with sufficient information from which to make a decision on whether or not to consider development and leasing of federal coal in the Carbon Basin. If part or all of the federal coal lands in the Carbon Basin area were decided to be acceptable for consideration of coal leasing and development, an EA or EIS would be completed for any future leasing and development proposal for the area.

Assumptions used in the analysis of environmental consequences are described in the following section. They include assumptions about the demand for various resources, the ability to meet the demand for various resources, the ability of the resources to meet the demand, the manner in which actions would be implemented, and the effects associated with certain types of actions. All assumptions are based on previous events, experience of BLM personnel, and knowledge of the resources in the planning review area.

4.2 ASSUMPTIONS

The following general assumptions apply to all analyses presented in this chapter. Assumptions specific to each alternative are listed under the introduction for each alternative.

Applicable laws, regulations, and policies would be complied with in the implementation of any decision resulting from this planning review. The effects discussed in the analysis are those that would result from such decisions, not those that would result from compliance with laws, regulations, and policies. Management actions would be implemented as stated, and funding and personnel would be adequate to carry out the actions. Standard operating procedures would be followed in the course of implementing the decisions.

4.2.1 CUMULATIVE IMPACTS

Impacts described in this section for Alternatives 1 and 2 also represent cumulative impacts that are anticipated to occur as a result of current and reasonably foreseeable activity in the Carbon Basin planning review area. Some potential impacts that are recognized to extend beyond the planning review area boundary include effects to water quality of the Medicine Bow River, air quality, and wildlife (in particular the Medicine Bow antelope and the Sheep Mountain mule deer herd units).

4.2.1.1 Coal

On the basis of historical data and current and projected market information, it is estimated that surface coal mining in the Carbon Basin area would remove 2.5 million tons of coal per year at a disturbance rate of approximately 240 acres per year. Surface mining would occur primarily along the margins of the coal development potential area. Surface disturbance within the interior of the coal development potential area

would be related to transportation, baseline data collection, and subsidence monitoring (i.e., related to subsurface coal mining).

Underground mining is likely to produce three to five million tons of coal per year. Surface disturbance resulting from the extraction of underground coal reserves is generally minimal and limited to location and construction of ancillary facilities and other related surface disturbing activities and to surface expression resulting from subsidence.

Surface mining pits, haul roads, overburden storage areas, topsoil stockpiles, and ancillary facilities would all contribute to a loss of vegetation within the planning review area. The approximate acreage that would be disturbed as a result of surface mining during any one year is 240 acres.

Long term vegetative reclamation would be accomplished 10 to 15 years after successful land surface reclamation measures were established. Initially, reclaimed lands would be dominated by grassland vegetation with brush species requiring 20-30 years to reach pre-mining densities. There would be no permanent reduction in vegetative productivity.

Prior to coal mine development whether involving private, state, or federal lands a permit application package must be submitted to the OSM and to the WDEQ/Land Quality Division (LQD). The application is reviewed by WDEQ/LQD to ensure compliance with permitting requirements and that the operation will meet the performance standards of the Wyoming program. In addition, Table 1.2 presented a list of federal and state permitting requirements that would need to be completed prior to mining. Regulations that serve as an authority for requiring these permits are designed to ensure the mitigation of impacts from surface coal mining. The following impact analysis considers these measures with some discussion of regulatory compliance, mitigation, and monitoring in terms of what is required by federal and/or state law (which applies to private, state, or federal lands and becomes part of both alternatives) and any additional mitigation and monitoring that may be required.

For analysis purposes the short-term is identified as five years or less and the long-term is identified as six years and beyond.

4.3. ALTERNATIVE 1

4.3.1 INTRODUCTION

This alternative would continue present management practices based on existing land-use plans and none of the federal coal within the planning review area would be leased or developed. Reasonably foreseeable levels of development and activity have been identified for analysis purposes. Major development proposals likely to occur in the planning review area over the next 20 years include development of private coal resources and a wind energy project.

Coal mining in the planning review area would occur as private/state coal reserves are developed. It is estimated that 25 million tons of private/state coal would be removed and 2,700 acres of private/state surface would be disturbed over 9-10 years. Existing infrastructure utilized to support coal mining in the planning review area may encourage the possibility of developing other private/state surface and/or underground coal resources in the area.

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The BLM would process any required ROW through the appropriate BLM permitting procedure. In addition to the private coal mining, any use presently occurring on BLM-administered public lands in the planning review area would continue. Livestock grazing, recreation, use of ROWs, etc. would occur.

Impacts described below represent the cumulative impacts that are anticipated to occur as a result of current and reasonably foreseeable activity in the Carbon Basin planning review area. Some potential impacts that are recognized to extend beyond the planning review area boundary include effects to water quality of the Medicine Bow River, air quality, and wildlife (in particular the Medicine Bow antelope and Sheep Mountain mule deer herd units).

4.3.2 EFFECTS ON CULTURAL RESOURCES

A Class III inventory for historic properties is required before a ROW is issued on public lands. All cultural resources located on public lands within the affected areas would be evaluated for National Register eligibility and determination of effect. If sites of National Register quality are identified on public lands compliance with Section 106 of the Historic Preservation Act would be undertaken and appropriate mitigation developed in accordance with procedures outlined in 36 CFR 800.

Identification of sites important to Native Americans for traditional, oral, or sacred values would require consultation with the appropriate Native American tribe(s). An ethnographic study may be required.

Increased human presence in the planning review area as a result of private coal mining would increase the probability of direct and indirect impacts to cultural properties. Sites would be subject to vandalism and damage from increased human and vehicular traffic.

4.3.3 EFFECTS ON PALEONTOLOGICAL RESOURCES

Rights-of-way and other authorizations may effect paleontological resources on the public lands. Mining of private/state coal and the associated activity on public lands may increase the frequency of unauthorized collection and vandalism of paleontological resources on the public lands.

If paleontological resources, either large and conspicuous and/or of significant value are discovered during any ROW construction activity, the find would be reported to the authorized officer immediately. A beneficial impact of exposure of fossil material during mining-related construction on the public lands would be the ability to study exposed material.

4.3.4 EFFECTS ON LANDS AND REALTY PROGRAM

Roads, powerlines, etc. required to develop private coal reserves would potentially conflict with turbine placement and transmission line location but to a much lesser degree than if federal coal mining occurred. It is likely that coal hauling would occur through the Simpson Ridge area to an existing loadout north of Hanna and may cause conflicts with windpower operations. Appropriate mitigation would be developed and included in both windpower leases and coal transportation ROWs. Prior rights would be protected.

Conflicts between mining of federal lands and development of wind energy generation would not occur under this alternative. Wind energy companies would not incur the potential costs of dealing with wind turbine design, temporary removal, or damage due to potential subsidence on federal coal lands. The knowledge that coal development would not occur on public lands would allow the wind generation companies greater flexibility and confidence in planning future wind energy development facilities.

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4.3.5 EFFECTS ON LIVESTOCK GRAZING

Livestock grazing would not be precluded. Activity in the region would slightly increase the amount of livestock forage lost. Impacts to livestock grazing as a result of the presence of roads, wind turbines, and powerlines associated with the windpower project would be minimal. Only two to three percent of the windpower project area would remain disturbed during the life of the project. Reclamation activities would reduce the long term loss of forage.

Mining of private and state owned coal, and related activities, would require that certain sections of the planning review area be closed to livestock grazing. The actual loss of forage available to livestock grazing would depend on the location of private/state mining activity and the timing of disturbance. The greater loss of forage would occur from areas of federal land excluded from grazing due to the hazards created from mining private/state coal reserves. The extent and duration of any suspension from grazing would depend on the pattern and duration of mining activity in the planning review area. Once mining is concluded and the hazards alleviated, suspended grazing privileges could be restored.

4.3.6 EFFECTS ON MINERALS RESOURCES

4.3.6.1 Coal

Development of Private/State Coal Reserves in Carbon Basin

Coal mining would occur on private and state lands under the guidance of all applicable federal, state, and local laws and regulations. Best available technology and mining practices would be conducted as required by the Surface Mining Control and Reclamation Act of 1977 (SMCRA). These laws assure that coal mining is conducted with as little impact as possible on resource values such as air quality, soils, watershed values, and water quality.

Mining of private/state reserves are likely to occur first along the southern portion of the planning review area. Reasonably foreseeable coal development within the planning review area would disturb approximately 2,700 acres. After extracting the recoverable surface minable coal from the southern portion of the area, it is likely that other private coal resources within the planning review area would be examined for economically recoverable reserves. If all private/state coal reserves in the planning review area were mined, approximately 5,280 acres would be disturbed.

The checkerboard land pattern of alternating sections of private, state and public land is prevalent toward the center of the planning review area. Private/state coal lands tend to follow the coal outcrop of the Johnson Seam, the most economically attractive seam in the basin. The location of the private and state coal resources would allow a company that secured the rights to mine the private and state coal to economically extract surface-minable reserves without involving any federal coal sections. This would mean that the federal coal present in the intervening public lands would become isolated blocks that are economically unrecoverable and would result in the loss of development of approximately 313 million tons of federal coal reserves. In addition, if no federal coal is mined, there would be a loss of revenue in the form of bonus bids and federal royalties coming from the sale of federal coal, half of which are distributed to the state and counties where the mining occurs.

Underground mining of the private/state coal would be difficult without the intervening federal coal lands to make up an efficient mining unit. The most attractive coal is located toward the center of the basin. If no federal leases are issued, 1,920 acres of private coal lands, comprising approximately 15% of the private/state underground reserve base would be inaccessible for mining using underground methods. The

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remaining private state coal lands could be accessed for underground mining although actual mining could be inefficient and/or economically unattractive.

4.3.6.2 Oil and Gas

The public lands would remain open to oil and gas leasing without the inherent problems that would occur with concurrent leasing of federal oil and gas and coal. No prior rights issues would arise or need to be resolved.

4.3.6.3 Locatable

The public lands would remain open to exploration and development of locatable minerals and location of mining claims. Locatable mineral development would not need to be constrained due to the mining of federal coal. No prior rights issues would arise or need to be resolved.

4.3.6.4 Salable Minerals

The public lands would remain open to exploration and development of salable minerals. Salable mineral development would not need to be constrained due to the mining of federal coal. No prior rights issues would arise or need to be resolved.

4.3.7 EFFECTS ON RECREATION

Dispersed recreation would continue to be allowed until it conflicts with any authorized use within the planning review area. Placement of wind turbines and mining activity on private land would reduce the recreational quality of the area to the point that some recreationists would not visit the area. Due to the very limited amount of legal public access (1,100 acres of public land and 480 acres of state land) within the planning review area, the impact to recreational activities on public lands is expected to be minimal. Access to the townsites of Carbon or to the Carbon cemetery would not change.

4.3.8 EFFECTS ON SOIL, WATER, AND AIR RESOURCES

4.3.8.1 Soil Resources

Approximately 2,700 acres of soil disturbance would occur during mining of private/state coal reserves within the planning review area. Approximately 270 acres of soil disturbance would occur as a result of windpower development within the planning review area.

Impacts to soils would occur during vegetation stripping, topsoil salvage, cut-and-fill operations, and increased exposure. Exposed soils would be subject to increased wind and water erosion until suitable vegetative cover is established. Temporary soil compaction could be caused by heavy equipment traffic during windplant construction and mining activity.

Impacts to soils as a result of mining private/state coal reserves includes changes in the physical, biological, and chemical properties of the soils. Following reclamation, the soils would change in texture, structure, color, accumulation of clays, organic matter, and chemical composition. The soils would be more uniform in type, thickness, and texture than pre-mining soils. Since only better soils would be salvaged for reclamation, the average quality of the soil would improve after reclamation is complete. The replaced topsoil would support a stable and productive vegetative community adequate for post-mining land uses.

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A relatively small acreage of public land would be disturbed during construction of roads and facilities required to develop private/state coal reserves. Exact location and amount of disturbance on public lands cannot be estimated at this time. Proper construction techniques and reclamation procedures would be part of any ROW issued by BLM.

4.3.8.2 Water Resources

Surface Water

Extent and location of impacts are difficult to determine at this level of analysis.

Drainage patterns of ephemeral streams on public land would not be disturbed. Windplant development and road construction would be designed to avoid altering or modifying surface waters. Impacts to ephemeral streams on private lands during mining of private/state coal may carry over to public land in the form of increased sediment loads and possible erosion. The impact to springs located on private/state land cannot be estimated without additional information on the location of future mining activities planned for these lands. Surface water flow patterns could be altered on public lands as a result of subsidence caused by underground mining occurring on private/state lands. Sedimentation ponds located on private/state lands would reduce sediment loads on public lands resulting from private/state coal mining activities.

Private/state coal mining is regulated by state and federal laws and actions would be taken during mine permitting to address these concerns.

Little or no surface water is likely to be used in either the windpower project or private/state coal mining. Some reduction in water quality may occur as a result of contaminants entering the ephemeral drainages from upland sources during runoff events. Other land uses in the planning review area that also could contribute to water quality impairment include livestock grazing, road maintenance, oil and gas operations, traffic on gravel roads, and off-road vehicle use.

Water released from private/state coal mining sedimentation ponds would be of better quality than that now carried by ephemeral streams. The sediment load delivered to the Medicine Bow River via Second and Third Sand Creeks during the period of sedimentation pond operation would be less than the load delivered by undisturbed streams. The chance of a pond failure releasing a large quantity of sediment to the Medicine Bow River during the projected time period that it would take to complete coal recovery, reclamation and revegetation is estimated to be less than 5%. The chance of a similar large quantity of sediment being released into the Medicine Bow River from the undisturbed basin is estimated to be between 30 and 40% (USD1, 1979). Only 65% of the total coal reserves in the planning review area could potentially be mined under this alternative.

Groundwater

The coal-bearing formations of the planning review area are essentially separated from the broad regional aquifers by a layer of semi-pervious Lewis Shale. This layer of shale eliminates hydraulic connection between the coal-bearing formations and the alluvium along the Medicine Bow River. Where the Medicine Bow River flows along the south side of the planning review area, the alluvium rests partly on the shale and partly on the Mesa Verde formation, which underlies the shale.

Coal, which is the principle aquifer of the Carbon Basin, would be removed from state and private reserves through mining. Subsurface flows would increase where an open or fractured zone is created by mining. The aquifers above the coal are likely to be dewatered through downward drainage. The drainage would

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be intensified by fracturing caused by subsidence. Aquifers below the coal could be dewatered by upward movement of water into a mine. After mining ceases, water levels would gradually return (complete recovery in about 40 years) to the pre-mining level in aquifers immediately above and below the mined areas (USDl, 1979).

The aquifers, which are small in extent, are unimportant because they do not contribute to the regional water supply and are essentially undeveloped. Loss of these aquifers would cause no impact on adjacent water users but could cause some springs used by wildlife to dry up.

The isolated nature of the planning review area precludes any impact to water quality outside the basin. Waters within the basin are moderately to highly mineralized but show no tendency to be acidic or toxic.

Coal mining occurring on private state lands could effect groundwater quality in the basin. Studies conducted in the Powder River Basin indicate that upon initial saturation, mine backfill is generally high in TDS and contains soluble salts of calcium, magnesium, and sodium sulfates (Van Voast and Reiten, 1988). This results from the exposure of fresh overburden surfaces to groundwater that moves through the reclaimed spoils. As the backfill saturates, the soluble salts are leached by groundwater inflow and TDS concentrations tend to decrease over time.

Water Use

Surface mines would use water at a rate of about 50 acre feet per year for dust control and equipment cleaning. If underground mining occurs approximately 220 acre-feet of water would be used per year for cooling equipment and suppressing dust. A mine would also require about three million gallons of potable water per year for human consumption and sanitary facilities.

Excess water in underground mines would be pumped to the surface into sedimentation ponds. The water would be treated if necessary and reused in the mining operation for dust suppression.

Water required for windpower development and private state coal mining would be obtained from deep wells on private property or off-site water sources and would not likely impact surface waters on the public lands. Other beneficial uses of water for livestock or wildlife would not be impacted.

Due to the small increase in the workforce required for private state coal mining and windpower development, it is not anticipated that an increase in municipal water supply would be required.

The increased water needs of all coal development projects in the planning review area would be analyzed during the permitting process.

4.3.8.3 Air Resources

Surface mining of private state coal reserves within the planning review area would produce large quantities of particulate emissions. Construction activities associated with the windpower project would also produce particulate emissions as would most other activities occurring in the planning review area. The specific sources would include, but are not limited to, fugitive dust associated with road construction, topsoil removal, drilling, blasting, soil stockpiling, haul road traffic, coal crushing, loadout activities, and wind erosion from exposed areas. Impacts of coal mining would occur throughout a mine life. Impacts from the windpower project would be reduced substantially following windplant construction. The magnitude of the effects depend on many factors including the size of the area disturbed, the erodibility of the soils disturbed, the steepness of the terrain, and precipitation patterns in the area.

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Particulate and other contaminant levels would be highest during any periods of simultaneous construction of the windpower project and coal mining.

Depending on various climatic and other physical conditions, total suspended particulate (TSP) levels could exceed the Wyoming Ambient Air Quality Standards within, and a short distance beyond, the planning review area boundary. Implementation of management practices to control fugitive dust would be required to meet air quality standards as dictated in operating permits issued by the Wyoming Department of Environmental Quality and other federal regulations.

Other potential sources of air contaminants include exhaust emissions from gasoline and diesel powered locomotives, haul trucks, and employer/employee vehicles which produce carbon monoxide, nitrogen oxides, and sulfur dioxide. Previous studies done by Radian Corporation in the Green River/Hams Fork and Powder River Basins have shown that transportation growth associated with coal development has an insignificant effect on the overall regional air quality (USDl, 1983). Mining and transportation emission related reductions in air quality in the planning review area are expected to be minimal, however, specific impacts cannot be predicted until detailed development plans are prepared and atmospheric dispersion modelling assumptions are specified.

4.3.9 EFFECTS ON VISUAL RESOURCES

Approval of various activities on public lands would occur under this alternative. Landscape character would change due to the development of access and transportation ROWs for mining of private coal reserves and development of the windpower project. The number of miles and extent of roads, powerlines, wind turbines, and pipelines crossing public lands is not known at this time. The presence of these facilities and a coal mine on private property would alter the landscape character of the area.

Surface mining of private state reserves would create contrasts to all basic elements of form, line, color, and texture within the planning review area under this alternative. A proposed mine would be located in a Class III VRM area, but much of the area is classified as seldom-seen (i.e., much of the mine area would not be visible from Interstate 80 or Wyoming Highway 72). It is likely that a few facilities (e.g., equipment, spoil piles, or other features) may be visible and would add to visual impacts in the area. Public lands adjacent to private state coal mining would become islands of undisturbed land. Appropriate mitigation required by the State of Wyoming would lessen the visual impact during the life of a mine and required reclamation of mined areas would eventually return the land to a pre-mining visual condition.

The visual impacts due to the presence of a proposed windpower project within the planning review area and adjacent area are addressed in the KENETECH Windpower Project EIS (USDl, 1995). VRM objectives would probably not be met in Class III areas where turbines are viewed at a distance of 2.5-3.0 miles or less (USDl, 1995). Moderate to strong contrasts to the basic elements of form, line, and color would occur from vantage points along Wyoming Highway 72. The basic element of texture shows a weak contrast (USDl, 1995).

The windpower project and a coal mine would appear as industrial facilities in a fairly rural landscape and would begin to command attention from viewers in the area. This concerns a significant effect due to the high visibility of wind turbines from points along Highway 72. Since there are no points along Highway 72 where both the windpower project and the private state coal mining would be visible, presence of a coal mine would not contribute to the significant impact to visual quality from vantage points along Highway 72.

The only location from which a coal mine within the planning review area and wind turbines on Simpson Ridge could be viewed simultaneously is from points on Interstate 80 west of the Arlington Summit. These

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vantage points are approximately 8 -10 miles from the planning review area and well beyond the 2.5 - 3.0 mile range at which wind turbines blend into the surrounding background (USDI, 1995).

The best information available indicates that the area of overlap for the Carbon Basin planning review area and the windpower project area (Figure 2.1) is the least likely location for placement of wind turbines. This would reduce the visual impacts within the planning review area.

4.3.10 HAZARDOUS MATERIALS

Impacts to soil, surface and groundwater resources, vegetation, livestock, and wildlife could result from hazardous material spills or leaks. Migration of hazardous materials from spills on private property or spills related to windpower or coal activity on or across public land are possible but remote. Any hazardous waste spills would be cleaned up by the operator to avoid or reduce endangering human health and/or the environment, as specified in either the Spill Prevention Control and Countermeasure Plan (SPCCP) or Hazardous Materials Management Plan (HMMP) for any mine within the planning review area.

Since any coal mine or windpower related activity within the planning review area would comply with all relevant federal and state laws concerning hazardous materials and with the requirements identified in an HMMP and SPCCP, no significant impacts are anticipated.

4.3.11 EFFECTS ON TRANSPORTATION

Local access roads would receive the largest increase in vehicle travel as a result of any increase in coal or windpower activity. Congestion would be the most severe direct impact and would be maximized during mine or windpower construction shift changes. A reduction in new road construction may be realized where windpower development and coal mining activities could use the same roads within the planning review area.

Rights-of-way for access/haul roads, powerlines and pipelines across public lands would likely be required to mine private/state coal. Existing ROWs across public land may need to be relocated to accommodate private/state coal mining and related activities. Prior rights would be protected for all ROWs of record. Any unforeseen conflicts in the planning review area would be identified and resolved during the state coal permitting process or during development of mining and reclamation plans.

4.3.12 NOISE

Existing land uses within the planning review area (e.g., livestock grazing, oil and gas production, transportation, recreation) contribute to noise levels, but wind is generally the primary noise source. Noise levels in the planning review area would be increased considerably by mining activities such as blasting, crushing, conveying, scraping, and hauling and along Wyoming Highway 72 where noise from truck traffic would be nearly constant throughout the day. These impacts would occur throughout the life of a mine.

OSM prepared a noise report for the Caballo Rojo Mine (OSM, 1980) which determined noise level from crushers and conveyors would not exceed 45 dBA at a distance of 1,500 feet. Explosives would likely be used during mining to fragment overburden and coal. Air overpressure created by blasting is estimated to be 123 dBA at the location of the blast, but at a distance of 1,230 feet, the intensity of the blast would be reduced to 40 dBA.

Because of the remoteness of the planning review area, noise would have little off-site effect on the human environment. No occupied ranches exist within 2,000 feet of the area proposed for private/state coal mining.

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Wildlife in the immediate vicinity of private/state mining may be adversely affected; however, observations at existing mines in Wyoming indicate that wildlife generally adapt to increased noise associated with active coal mining. After reclamation has been completed, noise would return to pre-mining levels.

Similar activities would occur during the construction of wind turbines and ancillary facilities. Windpower construction noise would be short term. The Noise Control Act of 1972 indicates that a 24-hour equivalent level of less than 70 A-weighted decibels (dBA) prevents hearing loss and a level below 55 dBA, in general, does not constitute an adverse impact. Noise levels at the base of turbines would range from 99.2 to 100.0 A-weighted decibels. Because windplant noise is generally masked by the wind at short distances from wind turbine generators (WTGs) and because there are few residences within or adjacent to the planning review area, impacts from WTGs would be minimal.

4.3.13 EFFECTS ON VEGETATION RESOURCES

4.3.13.1 Terrestrial

Windpower development and coal mining would disturb approximately 2,970 acres within the planning review area. The disturbance of vegetation on public land as a result of private/state coal mining related activities and windpower development would be restricted to that caused by construction of road ROWs, powerlines, wind turbine locations, or ancillary facilities permitted on public land. Loss of vegetation caused by mine pits, overburden storage areas, and topsoil piles would not occur on public lands under this alternative. Powerlines, ROWs, haul roads, etc. would be present for the life of any mine and would then be reclaimed. There would be no permanent loss of vegetation caused by coal mining following reclamation. Windpower development would cause a minimal, permanent loss of vegetation.

Redistribution of snow caused by wind turbines or spoil piles could alter vegetation patterns within the planning review area. Increased moisture as a result of snow accumulation could result in a change of vegetative type from sagebrush dominated sites to grass dominated sites. Shifts in species composition may be locally important but the overall mosaic within the planning review area would not change significantly.

4.3.13.2 Riparian/Wetland/Aquatic

Mining of private/state coal reserves may occur in areas designated as wetlands. The presence of jurisdictional wetlands on a mine property does not preclude mining, but must be specially permitted to assure that after mining is completed there would be no net loss of wetlands. Wetlands are delineated using approved U.S. Army Corps of Engineers (Corps) procedures. After the Corps verifies the delineations, the delineations become part of the WDEQ mine permit document.

Where feasible, no impact to the Medicine Bow River would occur during private/ state mining or windpower development. The river and riparian area would be protected by Section 404-Clean Water Act requirements or Executive Order 11990 requirements. Section 404 governs the placement of dredged or fill material in waters of the U.S., and Executive Order 11990 mandates no net loss of wetlands. If disturbance to wetland or riparian areas is unavoidable, appropriate mitigation measures would be developed in coordination with the Corps and BLM biologists for actions involving public land and with the state of Wyoming for actions involving private/state lands. U.S. Army Corps of Engineers would require replacement of wetlands and riparian areas lost during coal mining at least acre-for-acre and in-kind. Avoidance and mitigation measures would be applied to all present and future development.

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WDEQ regulations require the identification of AVF's prior to leasing and mining coal. AVF's must be identified because their presence can restrict mining activities. If an AVF is determined to be significant to agriculture, no impacts are permitted. Mining activities could occur if the AVF is determined not to be significant, but the AVF must be restored as part of the reclamation process.

4.3.13.3 Noxious Weeds

The potential exists for introduction of noxious weeds on public lands. Road and other ROWs across public lands used to access private/state coal mining areas and to develop windpower would be potential sites for noxious weed introduction. Equipment coming into the area from unknown locations, soil disturbance during road, pipeline, or powerline construction, and increased vehicular traffic, would all lead to a potential increase in noxious weeds on all (private, state, public) lands in the area. A noxious weed control program, including the use of weed-free mulch, revegetation of disturbed areas with native seed mixes, and periodic surveys for noxious weeds, would be part of any state or federal permitted project in the planning review area. With proper control and avoidance practices, noxious weeds can be controlled regardless of surface ownership.

4.3.14 EFFECTS ON WILDLIFE/FISHERIES HABITAT AND THREATENED AND ENDANGERED SPECIES

4.3.14.1 Wildlife

The amount of direct impact to wildlife habitat on public lands from activities associated with private/state coal mining and windpower development would depend on the location and acreage required for ROWs. Human disturbance on public lands in the planning review area would be related primarily to corridors needed to transport workers, equipment, and coal products. Once an area is disturbed, species that are intolerant to human presence would be affected the most. There seems to be a great variation in the tolerance to disturbance depending on species and time of year.

Loss of habitat and increased activity on private/state lands would likely cause animals to move onto public lands. Mining activity on private/state lands and vehicle traffic in general would cause additional stress to wildlife. How well wildlife acclimate to the increased activity would depend on location and timing of activity, existing stress levels caused by environmental factors, and ability to move to other less disruptive areas.

Mining activity may cause the displacement of wildlife species to other areas. When animals are displaced, they may or may not find equally suitable habitat that is not occupied by other animals, occupy suitable habitat that is already being used, or occupy poorer habitat than that from which they were displaced. In the second and third situations, displaced animals suffer from increased competition with other animals and are less likely to survive and reproduce. The consequences are often difficult to quantify because other factors such as annual rainfall and snowfall depths influence animal population and mortality. Small, less mobile animals may be less likely to relocate and may be killed during construction and development activities. Due to the large, diverse habitat available and the scattered nature of disturbance throughout the area, impacts to small animals would be minimal.

Direct impacts to wildlife would occur from construction and mining activities that would create barriers that restrict animal movement such as fences, spoil piles, and pits. Wildlife would also be directly affected as a result of vehicle/wildlife collisions caused by increased highway traffic.

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Big Game Habitat

The following description of impacts to wildlife have been developed with the assistance of the analysis presented in the KENETECH/Pacificorp Windpower Project EIS (USDI, 1995). The analysis for big game includes analyses at the planning review area level and the herd unit level to provide consistency with the KENETECH EIS. Impacts to other wildlife is restricted to the planning review area where appropriate.

The direct impacts of habitat loss resulting from construction of wind turbines, private/state coal mining and associated ancillary facilities, and other existing disturbance is quantifiable, and the significance of this loss can be estimated. However, the quantification of impacts of such influences as noise, visual disturbance, human activity, and changes in snow deposition on wildlife behavior and habitat use is difficult.

The amount of crucial habitat removed from a given herd unit by development activities is a quantifiable measurement of impacts to habitat function. The KENETECH EIS describes disturbance to crucial habitat for elk, deer (whitetail deer and mule deer), and pronghorn antelope. Because only mule deer and antelope crucial winter range exists within the planning review area whitetail deer and elk will not be discussed. The acreages presented below are for the amount of habitat actually disturbed. Increased human activity, vehicle traffic, and noise would all combine to increase the area avoided by wildlife. The increased habitat avoided by wildlife is not anticipated to be significant as animals over time habituate to routine sounds and activity.

The planning review area contains portions of two big game crucial winter ranges: approximately 25,700 acres (11.3%) of crucial winter range within the Medicine Bow pronghorn herd unit and approximately 5,700 acres (3.6%) of crucial winter range within the Sheep Mountain mule deer herd unit. Existing crucial winter range disturbance for the entire herd unit is 9,029 acres (4.0%) for the Medicine Bow herd unit and 4,491 acres (2.8%) for the Sheep Mountain herd unit (USDI, 1997). The estimated increase in disturbance of crucial winter range from windpower development and coal mining within the Medicine Bow pronghorn herd unit would be approximately 29%, for a total disturbance of 11,629 acres (5.1% of the herd unit). The estimated increase in disturbance of crucial winter range within the Sheep Mountain mule deer herd unit would be approximately 30%, for a total disturbance of 5,833 acres (3.7% of the herd unit). The estimate of disturbance that would be attributed to coal mining (2,460 acres for the Medicine Bow herd unit and 1,300 acres for the Sheep Mountain herd unit) are estimates of total disturbance over the life of a coal mine and do not account for the fact that mining would occur sequentially, with contemporaneous reclamation, rather than over the entire area at one time before reclamation begins. A conservative estimate of disturbance of 240 acres per year followed by subsequent reclamation over the 9-10 year life of mine would substantially reduce the impact presented above. The small percentage of land actually disturbed on a yearly basis would not reduce the local habitat at such a rate that wildlife species could not adjust to the reduction in habitat. Populations may be somewhat suppressed within the planning review area during the life of a mine but would be able to repopulate mined areas following reclamation. The use of appropriate shrub species in reclamation seed mixes would greatly reduce the impact of habitat conversion in the long term.

Noise, dust, and associated human presence may cause some local avoidance of foraging areas adjacent to mining activities and wind turbines, however, big game animals are highly mobile and can move to undisturbed areas. Many big game species continue to occupy areas adjacent to mining operations. It is likely that coal mining on private/state land would increase wildlife use of the public lands.

Non-Game Mammals

Direct losses to small mammals would be higher than for other wildlife since the mobility of small mammals is limited and many would retreat into burrows when disturbed. Mammals such as coyotes and rabbits

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would be temporarily displaced to other habitats while mining occurs and would return following reclamation. Populations of less mobile animals such as mice would decline during mining. However, these animals generally have a high reproductive potential and tend to re-invade and adapt to reclaimed areas quickly.

4.3.14.2 Game Birds

Sage grouse are the only game bird that would be affected by development in the area. Five known sage grouse leks exist within the planning review area. The protection of critical nesting habitat associated with sage grouse strutting grounds is essential. Private/state surface coal mining activity would disturb about 800 acres (2.5%) of potential nesting habitat within the planning review area. The actual disturbance would be less at any point in time as habitat is reclaimed during sequential mining and reclamation. Mitigation measures such as spatial and temporal restrictions on mining activity would reduce impacts to sage grouse during critical times of the year. Sage grouse breeding and nesting habitat buffer zones and timing restrictions would be addressed during WDEQ coal permitting to address specific situations.

Some additional disturbance to sage grouse nesting habitat is likely to occur due to construction of roads, powerlines, or wind turbines associated with the windpower project. However, the best information available indicates that the area of overlap for the Carbon Basin planning review area and the windpower project area is the least likely location for placement of wind turbines.

No leks or the one-quarter mile buffer surrounding the leks would be disturbed by either windpower development or activities associated with private/state coal mining occurring on public lands.

4.3.14.3 Non-Game Birds

Impacts to avian species as a result of windpower development and coal mining would occur by two primary methods: habitat disturbance and actual mortality of individual birds. Windpower and mining would disturb habitat during construction.

Raptor species are of particular concern as they show great sensitivity to disturbance during the nesting season. An exhaustive discussion of windpower impacts to raptors is covered in the KENETECH EIS and will not be discussed in detail here. Impacts to raptors depend on species distribution, population size, height at which various species forage, etc. Windpower related monitoring would identify impacts and suggest mitigation. Coal mining would add to the impact on raptor populations in the planning review area through reduction of foraging habitat and nesting sites. However, foraging area reduction would be a minimal and temporary concern in considering the relatively small size of the planning review area in comparison to the much larger foraging range of the raptor species involved. The reduction of raptor nesting sites would be temporary and site numbers could actually be maintained or increased through mine reclamation.

Certain mitigation measures such as seasonal disturbance restrictions have been shown to be valuable in reducing impacts to wildlife. A raptor mitigation plan would be prepared and approved subject to USFWS review and approval as part of the mining permit (or other permits, as required). Mitigation measures to provide alternate nest sites and relocation of nests would reduce direct loss of nests, juvenile birds, or nesting adults to activities resulting from mining and windpower development in the planning review area.

Foraging habitat for raptors would be reduced until revegetation successfully attracts small mammals which serve as prey.

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The wind turbines associated with the windpower project would have a direct impact on raptor and avian species. Direct loss of birds would occur due to blade strikes. This impact has been addressed in the KENETECH/Pacificorp Windpower Project EIS (USDI, 1995). Mitigation and consultation with the USFWS occurred during the preparation of the KENETECH EIS. The significance of the impact of wind turbines in the planning review area would depend on number of turbines, number of bird strikes, species killed, and the ability of, and likelihood that, birds would be displaced to other habitats following wind turbine construction.

4.3.14.4 Fisheries

No fisheries resources would be physically disturbed by any activity related to mining. The only impact that may potentially affect the fisheries in the area would be increased sediment to the Medicine Bow River in the southeast section of the planning review area. This area would receive special attention during any mine or ROW permitting process to assure that the integrity of the floodplain and riparian area is maintained.

4.3.14.5 Threatened and Endangered/State Sensitive Species

Threatened and Endangered Species

The Bureau of Land Management policy is to conserve T&E species and the ecosystems on which they depend. In addition, the BLM shall use existing authority in furthering the purpose of the Endangered Species Act (ESA). The policy is used to ensure that actions authorized on BLM-administrated lands do not contribute to the need to list any other Special Status Species under the provision of the ESA (BLM Manual 6840).

The Endangered Species Act (16 U.S.C. 1531-1543) protects listed T&E plant and animal species and their critical habitats. Surveys for T&E and candidate species have been conducted for the Simpson Ridge portion of the planning review area in conjunction with the SeaWest/Pacificorp (formerly KENETECH) windpower project. The following species would be a priority when surveys are conducted within the area: black-footed ferret, peregrine falcon, bald eagle, swift fox, whooping crane, and mountain plover. Formal consultation with the USFWS would be implemented and further guidelines would be developed for any mitigation or protection measures required.

Mammals

The direct impact to potential black-footed ferret habitat would be the loss of available prey due to surface disturbance by coal mining.

A mine permittee would be required to monitor prairie dog towns that fall within the path and within one-half mile of lands to be disturbed by private/state coal mining and related activities. Prairie dog towns would be monitored in accordance with the most recent USFWS guidelines for Wyoming within one year prior to physical disturbance of such sites. A letter of clearance would be required before mine related disturbance within one-quarter mile of any prairie dog colony would be allowed.

Any habitat loss due to coal development would be mitigated through reclamation and off-site habitat development. Project costs could be increased by mitigation of high priority habitat losses in coal development areas.

No recent sightings of swift fox have been reported on, or near, the planning review area. Direct impacts that may occur would be loss of potential prey: small mammals, insects, and birds due to surface

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disturbance by private coal mining and windpower development. Surveys conducted prior to denning would reduce the likelihood that den sites would be destroyed during mining. The absence of large areas of suitable habitat would reduce the likelihood that this species would be impacted by development in the planning review area. Reclamation methods to return mined areas to pre-disturbance vegetation would reduce long term effects on this species. Sequential mining and reclamation would be progressive, thus reducing the amount of disturbed habitat at any time.

Birds

Bald eagles using the Medicine Bow River corridor for roosting and foraging activities may infrequently visit the planning review area. Private/state coal mining and windpower development would reduce habitat for prey species utilized by the bald eagle. If during future monitoring a bald eagle roost is discovered, the monitoring program would be expanded and protection measures established as required. An exhaustive discussion of windpower impacts to raptors is covered in the KENETECH EIS and will not be discussed in detail here.

Direct impact to the peregrine falcon would be loss of available prey where small birds and waterfowl avoid the planning review area as a result of disturbance. The impact would be minimal due to the lack of suitable riparian and aquatic habitat in the area.

The overall impact to the mountain plover would be loss of suitable nesting habitat due to disturbance from private/state coal mining and windpower development. Mountain plover surveys, conducted in accordance with USFWS guidelines, would be required as part of the WDEQ permitting process. If plover habitat is identified on these lands, a habitat recovery and replacement plan would be required as part of the mine permit application. This plan, which would have to be approved by the USFWS, would be expected to reduce potential impacts to an acceptable level. Reclamation methods to return mined areas to pre-disturbance vegetation would reduce long-term effects on this species. Sequential mining and reclamation would be progressive, thus reducing the amount of disturbed habitat at any time.

Impacts to ferruginous hawks would include loss of habitat for prey species which include small to medium sized mammals such as jackrabbits, cottontails, ground squirrels, and prairie dogs. (Sherrod, 1978). The impact would be reduced as reclamation returns disturbed areas to near pre-mining vegetation that successfully attracts small mammals which serve as prey.

Direct impacts to loggerhead shrikes from surface mining operations on private/state lands would be the removal of small mammals and their burrows within the planning review area and the removal of the necessary vegetation that is used for nesting.

Due to the lack of recorded observations for the planning review area, it is unlikely that impacts to burrowing owls would occur.

State Sensitive Species of Concern

Mammals

No roosts for any state sensitive bat species have been found in the planning review area.

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Birds

Habitat for the twenty birds listed as Wyoming species of concern may be disturbed by private/state coal mining. Potential impacts to any of these species by activities associated with coal mining would be evaluated during the WDEQ permitting process.

4.3.15 EFFECTS ON SOCIO-ECONOMIC CONSIDERATION

Cumulative affects to the economy from development of windpower and coal mining would occur to employment, earnings, and tax revenue. The addition of a short-term windpower project construction workforce and a long term production and maintenance workforce would add diversity to the workforce, increase overall earnings within Carbon County, and provide additional tax revenue. Relative affects to local communities would depend on where workers choose to reside in the county. For example, a given number of workers residing in Rawlins would not have the same relative effect on Rawlins as the same number of workers residing in Elk Mountain would have on the community of Elk Mountain.

It is expected that the permanent workforce required for both coal mining transportation and the windpower project would reside in the communities in the same proportions as the current coal mine work force. The additional mining and windpower related workforce salaries, taxes, etc. would be expected to provide the revenue required to support the additional government related services required by the expanded workforce.

Mining only the private/state coal reserves would result in a shorter life of mining in the Carbon Basin and reduce related economic benefits to the communities of Carbon County compared to mining of additional federal coal reserves. Once the decision to bypass the federal coal is made and the private/ state reserves are mined, the federal coal reserves become uneconomical to mine at a later date due to the checkerboard land pattern of the area. In the event the federal coal is not leased, the potential income from the bonus bid, future royalties and taxes on approximately 313 million tons of coal would be also foregone. Federal revenue would accrue from authorizing ROWs and other activities on the public lands that would be associated with private/state coal mining such as potential access roads and powerlines.

The mining-related workforce would remain about the same during the short-term, as employees move from the current Arch of Wyoming mines in the Hanna Basin to anticipated mining operations on private/state coal lands in the Carbon Basin. While employment may increase over the long-term if other mining ventures are pursued, capital investment would not substantially increase in the short-term. As mining operations cease at the existing mines in the Hanna Basin, operations and facilities would be transferred to the Carbon Basin area. Capital investment may increase in the long-term if additional mines are developed.

The location of the Carbon Basin in relation to current coal facilities at Hanna would require that coal be transported to the existing loadout facility at Hanna or to a new loadout facility along the Union Pacific Railroad mainline between Hanna and Medicine Bow. Surface coal mining in the Carbon Basin would require the addition of up to 40 workers per mine to transport coal by truck to the railhead. This would add approximately \$ 2.5-3.0 million per year to the salaries paid within Carbon County.

If the coal is shipped by rail to the Union Pacific mainline, the temporary specialized workforce required to construct the rail spur would likely be from out-of-county or out-of-state and would not add appreciably to the county economy. The workforce required to operate and maintain the rail spur would be approximately the same as the workforce required to operate the current Arch of Wyoming facility and would add little to the economy of the county.

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Current community infrastructure in the towns of Hanna, Medicine Bow, and Elk Mountain is expected to be sufficient to handle the potential increase in population caused by the trucking-related workforce for one new mine. An additional mine within the planning review area with additional mining related and transportation related workers would place additional pressure on local services and facilities. As additional workers are hired and additional population moves into the county, employment in the government sectors and service sectors would correspondingly increase. The additional mining related workforce salaries, taxes, etc., would be expected to provide the revenue required to support the additional government-related services.

Windpower development would add to all sectors of Carbon County employment and economy. The required construction laborforce would be approximately 161 workers. Construction payroll would be in excess of \$3 million dollars during the initial year of construction. Long term operations and maintenance labor force would range from 7 to 29 employees for the twenty year analysis period. The windpower project would add approximately \$500 million to capital investment in the County that would generate in excess of \$1.1 million in additional tax revenue. Windpower development would add insignificantly to impacts on community infrastructure and services.

Other economic sectors of the economy within the planning review area or in the local area such as oil and gas development, livestock grazing, and services show no indications of marked increases or decreases in activity.

4.3.16 EFFECTS ON ENVIRONMENTAL JUSTICE

Issues relating to the social, cultural, and economic well-being and health of minorities and low income groups were evaluated. Such issues are termed environmental justice issues. None were identified that would be effected.

There are no communities within the vicinity of the planning review area that would be physically impacted by coal mining. Elk Mountain, the nearest community to the proposed coal mining, is five miles away. Distance and topography shield Elk Mountain from any adverse impacts resulting from coal mining within the area. The Interstate 80 ROW passes between Elk Mountain and the planning review area and creates a visual and noise related buffer that reduces impacts from coal mining to a negligible level.

Windpower development within the windpower project area would also have a negligible physical impact on the town of Elk Mountain or on other communities within the area. As described for coal mining, distance and topography shield the communities from any physical impacts of project development. Other impacts related to visual resources and socio-economic activity are addressed in the appropriate sections of this analysis.

Compliance with Executive Order 12898 concerning environmental justice was accomplished through scoping conducted to receive public comment. In reviewing the impacts of this alternative on socioeconomic resources, surface water and groundwater quality, air quality, hazardous materials, or other elements of the human environment, it was determined that potentially adverse impacts do not disproportionately affect Native American tribes or minority and/or low-income groups.

4.3.17 EFFECTS ON HEALTH/SAFETY

Vehicle accidents in the short-term would be expected to increase above current levels with the addition of coal haul trucks and windpower construction traffic on local roads. This impact would depend on timing of construction of the various activities within the planning review area. With proper driver training and

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observance of posted speed limits the increased level of accidents is expected to be minimal. Private vehicle traffic is not anticipated to change as a result of private/state coal mining in the planning review area. As mining activity is reduced at the Medicine Bow Mine and Seminoe No. 2 after the year 2000, activity would increase with anticipated future mining in the Carbon Basin area. Local health and law enforcement infrastructure currently in place is adequate to handle activity related to the mines in the Hanna Basin. It is anticipated that private/state coal mining activity in the Carbon Basin would not occur before Arch of Wyoming's Medicine Bow Mine in the Hanna Basin ceases production. Few additional services would be required to handle mining activity within the Carbon Basin planning review area once the Medicine Bow mine in the Hanna Basin ceases operation.

With coal production activities currently occurring in the Hanna Basin to the north, related accidents, highway traffic, and health needs would be handled by existing services in the towns of Hanna, Medicine Bow, and Rawlins.

4.4 ALTERNATIVE 2

4.4.1 INTRODUCTION

Under this alternative, a total of 12,088.36 acres of federal coal lands containing approximately 313 million tons of federal coal in the Carbon Basin planning review area would be open to consideration for coal leasing and development. Of the 12,088.36 acres of federal coal lands, 7,410.54 acres are federal surface-federal coal and 4,677.82 acres are split-estate lands where private/state surface overlie federal coal.

This alternative would continue present management practices based on the RMP and consider coal mining of both federal and private/state coal reserves. Reasonably foreseeable levels of development and activity identified in the No Action alternative would occur. Any mitigation measures or plans required as part of the WDEQ permitting process for private coal mining identified under Alternative 1 would apply to both private/state and public land under alternative 2. In many places narratives have been repeated to avoid referring to Alternative 1.

It is estimated that 30.4 million tons of federal and private/state coal would be removed and 2,900 acres of surface would be disturbed over 11-12 years. Existing infrastructure utilized to support coal mining in the planning review area may encourage exploration into the possibility of developing other coal resources in the area.

The BLM would process ROW authorizations through the appropriate BLM permitting procedures. In addition to the mining of coal, other uses such as livestock grazing, recreation, and other authorizations would continue to occur where practical on public lands in the planning review area.

Impacts described below represent the cumulative impacts that are anticipated to occur as a result of current and reasonably foreseeable activity in the Carbon Basin planning review area. Some potential impacts that are recognized to extend beyond the planning review area boundary include affects to water quality of the Medicine Bow River, air quality, and wildlife (in particular the Medicine Bow antelope and Sheep Mountain mule deer herd units).

4.4.2 EFFECTS ON CULTURAL RESOURCES

In order to preserve the historic setting surrounding the Town of Carbon Cemetery, 120 acres of federal coal land would be closed to mining by surface mining methods, but would be open to leasing and development by subsurface mining methods (See Coal Appendix).

Prior to federal coal leasing, the planning review area would be inventoried for historic properties to the Class III level. Increasing the area available for coal mining would provide for the potential of locating additional sites from which information can be obtained. All cultural resources located within the affected areas would be evaluated for National Register eligibility and determination of effect. If sites of National Register quality are identified within the area, compliance with Section 106 of the Historic Preservation Act would be undertaken and appropriate mitigation developed in accordance with procedures outlined in 36 CFR 800.

Allowing for leasing and development of federal coal in the planning review area would increase the chance that subsurface sites, which cannot be located prior to mining, would be impacted by mining operations. If cultural resources are discovered during any mining operations or related activity, the lessee would be required to bring them to the attention of the authorized officer (See the Requirements and Mitigation section of the Coal Appendix for additional protective measures required).

The availability of federal coal lands in the planning review area would make mining by underground methods more economical and efficient. Underground mining would increase the chance of subsidence which may affect cultural sites by disturbing their spatial, horizontal, and vertical distribution and possibly by increasing erosion. Subsidence may occur over long periods of time but does not preclude the potential disturbance or destruction of subsurface cultural sites.

If cultural sites important to Native Americans for traditional, oral, or sacred values are identified on federal coal lands within the planning review area, consultation with appropriate Native American tribe(s) would be required prior to coal development. An ethnographic study may be required.

Increased human presence in the planning review area associated with the mining of federal coal reserves would increase the probability of direct and indirect impacts to cultural properties from vandalism and damage caused by human and vehicular traffic.

4.4.3 EFFECTS ON PALEONTOLOGICAL RESOURCES

Potential impacts to paleontological resources would consist of losses of plant and invertebrate and vertebrate fossil materials for scientific research, public education, and other values on public lands where coal resources are developed. Losses to varying degrees would result from destruction, disturbance, or removal of fossil materials as a result of coal mining activities, unauthorized collection, and vandalism.

An additional impact of coal development would be the exposure of fossil materials for scientific examination and collection which might otherwise never occur except as a result of overburden removal, exposure of rock strata, and mineral excavation.

If paleontological resources, either large and conspicuous and/or of significant value are discovered during construction, the find would be reported to the authorized officer immediately (the Coal Appendix describes additional procedures for the protection of paleontological resources).

4.4.4 EFFECTS ON LANDS AND REALTY PROGRAM

Existing roads and or ROWs for powerlines and pipelines would be relocated to accommodate coal mining and related activities. Areas with existing ROWs would be open to coal leasing and development, subject to valid existing rights and negotiations for relocating pipelines and powerlines, if necessary. Prior rights would be protected for all ROWs of record. Any unforeseen conflicts in the planning review area would be identified and resolved during the coal leasing process or during development of mining and reclamation plans.

Surface or subsurface coal mining and surface related activities would be prohibited on federal coal lands within a 100-foot buffer zone around cemeteries and a 300-foot buffer around occupied structures. Should conflicts arise, it would be the responsibility of the lessee to show that the conflicts between mining activity and the buffer zone would be adequately addressed and mitigated to the satisfaction of both parties. These situations, if they arise, would be addressed during the course of processing federal coal lease applications and prior to issuing any federal coal lease.

A strong conflict would occur between windpower development and federal coal mining where federal coal is extracted using surface mining methods and the placement of wind energy facilities would occur at the same location. The planning review area and the Simpson Ridge windpower project area have 13,120 acres of overlap. Where the federal coal is mined by underground mining methods, there may or may not be a conflict depending on the extent of subsidence and ability to design wind turbine tower foundations that compensate for subsidence.

The exact location of wind energy facilities or the pace and direction of development are unknown. Coal mining in the coal/windpower overlap (Fig 2.1) area is not expected to begin within the next 10 years. The exact location of coal seams, mining method, or sequence of development are also unknown at this time. Therefore, the potential for conflict between windpower development and coal mining exists, but the exact nature or extent of the conflict cannot be determined at this time.

Bureau of Land Management policy is to preserve the value of federal coal while allowing for multiple use of public lands that overlie coal resources. Roads, pipelines, and other facilities are currently authorized on public land overlying known coal resources in Carbon County without any known reduction in coal value. However, wind energy facilities, especially turbine towers, present a unique situation.

The BLM would conduct environmental analyses on subsequent phases of wind energy development and coal leasing. More detailed information for future phases of development would identify the exact nature of any conflicts. BLM would work with all affected parties to minimize impacts. For example, techniques are available, both for coal mining and turbine foundation and tower design, that may minimize subsidence impacts.

Because mining in the overlap area may not occur in the near future, and because placement of wind energy facilities or coal mining activities cannot be determined at this time, BLM has placed the following provision in the wind energy ROW grant:

Federal coal resources underlie a portion of the Simpson Ridge Windpower Project Area. To prevent federal coal resources from being devalued by surface improvements, the grant holder may place wind energy facilities on the public lands identified below, but bears the responsibility for repair, replacement, or lost revenue should the BLM subsequently lease federal coal and the mining of such coal damage or impair the operation of wind energy facilities. The lands subject to this condition are:

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T. 21 N., R. 80 W.

Section 12: All

Section 14: All

T. 22 N., R. 80 W.

Section 22: NE $\frac{1}{4}$, S $\frac{1}{2}$

Section 26: N $\frac{1}{2}$ NW $\frac{1}{4}$, SW $\frac{1}{4}$ NW $\frac{1}{4}$

Section 34: All

This provision would assure that wind energy development proceeds without undue risk to future coal mining operations. BLM is committed to work closely with land and mineral owners, wind energy and coal companies, and state and local government agencies to assure that unnecessary impairment of either industry does not occur.

4.4.5 EFFECTS ON LIVESTOCK GRAZING

Mining related surface disturbance, hazards (e.g., open pits, shafts, and drifts), heavy equipment use, and vehicle traffic would require that certain sections of the planning review area be closed to livestock grazing use during coal mining. The amount of land and AUMs involved in such closures from the two grazing allotments and the impact on individual livestock operators would depend on the location of mining activity and the timing of disturbance. Once a coal lease application is received by the BLM, a two-year notification of possible suspension of grazing preference would be sent to all livestock operators of record. This would allow the grazing permittees two years to adjust their operations around the mining activity. Areas that could be fenced off and still accommodate grazing during the life of a mine would be considered. Following mining and acceptable reclamation, forage would again be available for livestock grazing and suspended preference would be restored to the level supported by the reclaimed lands.

4.4.6 EFFECTS ON MINERAL RESOURCES

4.4.6.1 Coal

Coal mining in the planning review area would occur under the guidance of all applicable federal, state, and local laws and regulations. Best available technology and mining practices implemented under SMCRA and other laws as part of any mining operation would assure that the coal resource would be removed with as little impact on air quality, soils, watershed values, and water quality as possible.

The likely development scenario over the twenty year analysis period is that the southern portion of the basin would be developed first, using surface coal mining techniques. Including availability of federal coal under this alternative would add approximately 5.4 million tons of federal coal and 200 acres of surface disturbance on public lands to the reasonably foreseeable development scenario described under Alternative 1. Based on the history of current operations in the Hanna Basin, surface disturbance in the review area would average 240 acres per year for surface mining operations, including the placement of facilities, haul roads and ponds. This disturbance rate is based on an average coal recovery rate of 2.5 million tons per year. Using historical data, it is estimated that economically recoverable surface minable reserves in the southern portion of the planning review area would last approximately 11 to 12 years. The life of mining could increase as the surface reserve base becomes better defined or if underground mining proves economical.

Coal reserves with potential for underground mining would be evaluated to determine if they could be economically recovered. It is a standard mining practice to access underground coal reserves from the final

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highwall that remains after all economically recoverable surface minable reserves have been extracted. Underground mining would likely extract coal at a rate of three to five million tons per year. Additional surface disturbance as a result of underground mining is difficult to determine because most of the impact would be related to subsidence. Additional surface disturbance associated with the underground mining operations may occur if additional mine and ancillary facilities are required.

If all surface minable coal reserves within the planning review area are mined at some point in the future, an estimated 7,000 total acres in all ownerships (1,200 acres public land surface and 5,800 acres private/state) would be disturbed. This amounts to approximately 18% of the 38,459 acres in the planning review area.

Restrictions to protect visual, cultural, wildlife, air, and water resources impact coal development by increasing the costs of operation. Costs of mitigation to reduce impacts may preclude mining of certain areas. Non-coal related ROWs can impact the extraction of the coal resource by causing coal to be left unmined or by adding to operating costs due to mitigation. Increased operating costs may lead to abandonment of an operation as uneconomical, if an increase in cost is not supported by an increased price for coal.

Under this alternative, approximately 43 million tons of surface minable federal coal reserves and approximately 270 million tons of underground minable federal coal reserves could be developed, and the state/county would receive a share of the federal monies obtained from bonus bids and production royalties.

As mining occurs within the planning review area, coal reserves would be irretrievably lost from the resource base.

4.4.6.2 Oil and Gas

Public lands would remain open to oil and gas leasing. Concurrent development of oil and gas with coal would be encouraged as long as it did not result in a significant loss of federal coal. On a case-by-case basis, appropriate stipulation(s) would be placed on new oil and gas leases issued in areas open to coal development and further coal leasing consideration (See Coal Appendix).

Coal mining operations conducted on leases issued within producing oil and gas fields would not interfere with the economic recovery of oil and gas, except as determined by BLM. The rights granted in a coal lease would be subject to prior existing rights of oil and gas leases encumbering all or part of the same acreage. BLM retains authority to alter or modify coal operations on lands covered by oil and gas leases to avoid interference with prior existing rights.

4.4.6.3 Locatable Minerals

Public lands would remain open to exploration and development of locatable minerals and location of mining claims. In areas leased for federal coal, mineral location could occur; however, the coal lease would represent a prior existing right and the claimant would be required to compensate the coal lessee in order to develop locatable minerals.

4.4.6.4 Salable Minerals

Public lands would remain open to exploration and development of salable minerals. To avoid conflicts, salable mineral development would be coordinated to avoid interference with federal coal development.

4.4.7 EFFECTS ON RECREATION

Dispersed recreation would continue in the planning review area until it conflicted with coal development. Recreational pursuits of all kinds would be heavily restricted or eliminated within the mine permit boundary during the life of any mine.

Due to the very limited amount of legal public access (1,100 acres of public land and 480 acres of state land) within the planning review area, the impact to recreational activities on public lands is expected to be minimal. Once mining and reclamation is complete, the areas with legal public access would again be available for public recreation.

4.4.8 EFFECTS ON SOIL, WATER, AND AIR RESOURCES

4.4.8.1 Soil Resources

Mining of federal coal reserves would add about 200 acres of surface disturbance on public lands to the reasonably foreseeable development scenario described in Alternative 1. Maximum development of all federal coal reserves would disturb approximately 1,200 acres of public land surface (3.1%) within the planning review area in addition to the 5800 acres of maximum disturbance on private/state lands described in Alternative 1.

Strip mining would involve the excavation and storage of topsoil and overburden material and the building of roads and facilities. Increased wind and water erosion would occur on stockpiled materials and other areas of exposed soils. Prompt revegetation of disturbed areas would reduce the amount and time soils are exposed to wind and water erosion.

Alterations of soil horizons and topography by mining and placement of culverts, drainage ditches, and diversions could increase flow velocities across unprotected surfaces and could accelerate sheet, rill, and gully erosion. The main areas of concern would be on reclaimed areas not yet protected with vegetation and newly designed and revegetated channels and diversions for water transport.

Mining and related surface-disturbing activities would alter existing soil characteristics. Soil characteristics include presence and amount of soil microorganisms, structure, texture, organic matter content, infiltration rate, permeability, water holding capacity, salinity, nutrient levels, and productivity levels that have developed over geologic time. However, because of limited topsoil material, steepness of slopes, aspect, surface disturbance, and climate (primarily precipitation and temperature), reclamation efforts in the area would be difficult. Some soils would be left disturbed during the life of any mine while others would be recontoured and revegetated within five to ten years.

4.4.8.2 Water Resources

Surface Water

The mining of coal reserves using surface mining methods could alter the drainage pattern of the ephemeral streams within the planning review area. Carbon, First, Second and Third Sand Creek drainages flow through areas where surface mining is likely. During the mine permitting process, it may be determined that some drainages would be best avoided, while short reaches of other drainages would be diverted around mine pits and held in temporary channels and/or ponds. Neither the impoundment of water nor the resultant channel changes would have any impact on downstream users. Drainages would be reconstructed after surface operations are complete, leaving no long term impact.

Both state and federal regulations require that surface runoff from mined lands be treated as necessary to meet effluent standards. Therefore, sediment would be deposited in ponds to ensure that total maximum daily loads (TMDLs) are not exceeded.

Surface flow patterns could be altered due to subsidence caused by underground coal extraction. Subsidence occurring over subsurface mine workings may also cause water to drain from stream channels into underground openings.

A minimal amount of surface water would be used in coal mining, mainly for dust suppression on haul roads. Some reduction in water quality may occur as a result of contaminants entering the ephemeral drainages from upland sources during runoff events.

Water released from the sedimentation ponds would be of better quality than that now carried by the ephemeral streams (see discussion under Surface Water). The sediment load delivered to the Medicine Bow River via Second and Third Sand Creeks during the period of sedimentation pond operation would be less than the load delivered by undisturbed streams. The chance of a pond failure releasing a large quantity of sediment to the Medicine Bow River during the projected time period that it would take to complete coal recovery, reclamation and revegetation is estimated to be less than 5%. The chance of a similar large quantity of sediment being released into the Medicine Bow River from the undisturbed basin is estimated to be between 30 and 40% (USDI, 1979).

Groundwater

The coal-bearing formations of the planning review area are essentially separated from the broad regional aquifers by a layer of semi-pervious Lewis shale. This layer of shale eliminates hydraulic connection between the coal-bearing formations and the alluvium along the Medicine Bow River. Where the Medicine Bow River flows along the south side of the planning review area, the alluvium rests partly on the shale and partly on the Mesa Verde formation, which underlies the shale.

Coal, which is the principle aquifer of the basin, would be removed through mining. In its place would be left an open or fractured zone that transmits water at a faster rate than the coal. The aquifers above the coal could be dewatered through downward drainage to any mined-out zone. The drainage would be intensified by fracturing caused by subsidence where underground mining has occurred. Aquifers below the coal could be dewatered by upward movement of water into the mined-out zone. After mining ceases, water levels would gradually return (complete recovery in about 40 years) to the pre-mining level in aquifers immediately above and below the mined area (USDI, 1979).

The aquifers, which are small in extent, are unimportant because they do not contribute to the regional water supply and are essentially undeveloped. Loss of these aquifers as a result of coal mining on lands of all ownerships would cause minimal impact on adjacent water users, but could cause some springs used by wildlife to dry up. These springs may or may not be primary water sources for local wildlife and their loss may only affect distribution of the animals. Artificial water sources may be required to replace lost natural water sources.

The isolated nature of Carbon Basin precludes any impact to water quality outside the basin. Waters within the basin are moderately to highly mineralized but show no tendency to be acidic or toxic. There are no dangerous quantities of acidic or toxic elements in the overburden, therefore, no significant changes in the quality of groundwater are anticipated.

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Water Use

The additional development of federal coal reserves would not increase the annual rate of water use but would extend the life of mining and subsequent use of water. Surface mines would use water at a rate of about 50 acre-feet/year for dust control and equipment cleaning. Underground mines would use about 220 acre-feet/year for cooling equipment and suppressing dust. The mines would also require about three million gallons of potable water per year for human consumption and sanitary facilities. Water sources currently used by livestock or wildlife would be avoided or mitigated during mining.

Excess water in underground mines would be pumped to the surface into sedimentation ponds. The water would be treated if necessary and reused in the mining operation for dust suppression.

The water required for mining operations that include additional federal coal reserves would be nearly the same as that used for private state mining except some water could be obtained from deep wells on public lands. Another common water source is pit water from either surface or subsurface sources.

Due to the small increase in workforce required for mining on lands of all ownerships within the planning review area, it is not anticipated that an increase in municipal water supply would be required. Increased water needs of all coal development projects would be analyzed during the leasing/permitting process.

4.4.8.3 Air Resources

The additional development of federal coal reserves would increase the duration of impacts identified in Alternative 1. Surface coal mining within the review area would produce large quantities of particulate emissions. The specific sources would include, but are not limited to, fugitive dust associated with road construction, topsoil removal, drilling, blasting, soil stockpiling, haul road traffic, coal crushing, truck dumping, shovel/truck loading, loadout activities, and wind erosion from exposed areas. The magnitude of the effects depend on many factors including the size of the area disturbed at any given time, the erodibility of the soils disturbed, the steepness of the terrain, and precipitation patterns in the area.

Depending on various climatic and other physical conditions, the TSP levels could exceed the Wyoming Ambient Air Quality Standards within the planning review area and a short distance beyond the planning review area boundaries. Implementation of management practices to control fugitive dust would be required to meet air quality standards as dictated in the operating permit issued by the Wyoming Department of Environmental Quality and other federal regulations.

Other potential sources of air contamination include exhaust emissions from gasoline and diesel powered locomotives, haul trucks, and employer/employee vehicles which produce carbon monoxide, nitrogen oxides, and sulfur dioxide. Previous studies done by Radian Corporation in the Green River/Hams Fork and Powder River Basins have shown that transportation growth associated with coal development has an insignificant effect on the overall regional air quality (USD, 1983). Mining and transportation emission related reductions in air quality in the planning review area are not expected to be greater in magnitude with the additional mining of federal coal reserves; however, the duration of impacts would be longer. Specific impacts cannot be predicted until detailed development plans are prepared and atmospheric dispersion modelling assumptions are specified.

4.4.9 EFFECTS ON VISUAL RESOURCES

Mining federal coal in the planning review area would add to the change in character of the area. Mining and related activities on public, state, and private lands would result in a change from a rural, infrequently

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visited landscape to a more industrialized landscape within the planning review area and would extend the duration of mining. Changes in character of the landscape would not be permanent. All surface equipment would be removed at the end of the productive life of any mine and all disturbed land would be reclaimed to near pre-mining conditions.

Surface mining activities and structures would create a contrast to all basic elements of form, line, color, and texture. Underground mining in the planning review area would be far less obtrusive but above-ground facilities would still create a contrast with all basic elements. Appropriate mitigation (siting requirements and painting buildings and structures) would lessen the visual impact during the life of a mine and required reclamation of mined areas would eventually return the area to a visual state that would be comparable to pre-mining conditions.

4.4.10 HAZARDOUS MATERIALS

Impacts to soil, surface and groundwater resources, vegetation, livestock, and wildlife could result from hazardous material spills or leaks. Any hazardous waste spills would be cleaned up by the operator to avoid or reduce endangering human health and/or the environment, as specified in either the Spill Prevention Control and Countermeasure Plan (SPCCP) or Hazardous Materials Management Plan (HMMP) for any mine within the planning review area.

Since any mine activity within the planning review area would comply with all relevant federal and state laws concerning hazardous materials and with the requirements identified in an HMMP and SPCCP, no significant impacts are anticipated.

4.4.11 EFFECTS ON TRANSPORTATION

Local access roads would receive the largest increase in travel as a result of coal haul trucks. Congestion would be the most severe direct impact and would be maximized during mine shift changes. Under the reasonably foreseeable development scenario, surface mining of federal coal reserves would lengthen the duration of transportation increases for one to two years. If additional federal, private, or state surface coal reserves are mined, or if underground mining occurs, these increases could last for several years.

4.4.12 NOISE

Noise levels in the area would increase considerably by mining activities such as blasting, crushing, conveying, scraping, and hauling. The Noise Control Act of 1972 indicates that a 24-hour equivalent level of less than 70 A-weighted decibels (dBA) prevents hearing loss and a level below 55 dBA, in general does not constitute an adverse impact.

OSM prepared a noise report for the Caballo Rojo Mine (OSM, 1980) which determined noise level from crushers and conveyors would not exceed 45 dBA at a distance of 1,500 feet. Explosives would likely be used during mining to fragment overburden and coal. Air overpressure created by blasting is estimated to be 123 dBA at the location of the blast, but at a distance of 1,230 feet, the intensity of the blast would be reduced to 40 dBA, a negligible impact.

Because of the remoteness of the site, noise would have little off-site effect on the human environment. Wildlife in the immediate vicinity of mining may be adversely affected; however, observations at existing mines in Wyoming indicate that wildlife generally adapt to increased noise associated with active coal mining.

After reclamation has been completed, noise would return to pre-mining levels.

4.4.13 EFFECTS ON VEGETATION RESOURCES

4.4.13.1 Terrestrial

The addition of federal coal reserves to the reasonably foreseeable development described in Alternative 1 would disturb an additional 200 acres (3,170 acres total) within the planning review area.

Surface mining pits, haul roads, overburden storage areas, topsoil stockpiles, and ancillary facilities would all contribute to a loss of vegetation within the planning review area. The approximate acreage that would be disturbed as a result of surface mining during any one year is 240 acres.

The acreage of vegetation disturbed by surface mining would be far greater than that caused by underground mining. In a typical mining scenario, underground mining would not likely occur until depletion of surface minable reserves. Underground mining would normally utilize existing surface facilities which could be converted to provide underground mining support.

Long term vegetative reclamation would be accomplished 10 to 15 years after successful land surface reclamation measures were established. Initially, reclaimed lands would be dominated by grassland vegetation with brush species requiring 20-30 years to reach pre-mining densities. There would be no permanent reduction in vegetative productivity.

4.4.13.2 Riparian/Wetland/Aquatic

Springs and drainages in the planning review area would be avoided, where practical, during mining. It is likely that surface mining would disturb riparian/wetland areas, however, impacts to wetlands and riparian areas would be negligible because most past and all present and future development activities would comply with Section 404 of the Clean Water Act and Executive Order 11990 which mandates no net loss of wetlands. If disturbance to wetlands or riparian areas is unavoidable, appropriate mitigation would be developed in coordination with the Corps and BLM biologists for actions involving federal land and with the state of Wyoming for actions involving private land. The U.S. Army Corps of Engineers would require replacement of wetlands and riparian areas at least acre-for-acre and in kind. Avoidance and mitigation measures would be applied to all present and future development.

WDEQ regulations require the identification of AVFs prior to leasing and mining. AVFs must be identified because their presence can restrict mining activities. If an AVF is determined to be significant to agriculture, no impacts are permitted. Mining activities could occur if the AVF is determined not to be significant, but it must be restored as part of the reclamation process.

4.4.13.3 Noxious Weeds

Mining of federal coal reserves would not increase the chance of noxious weed introduction into the planning review area above that described for reasonably foreseeable development in Alternative 1. Equipment bearing weed seed would be transported from unknown areas, soils would be disturbed, and vehicle traffic would increase in the area. All of these activities lend themselves to noxious weed invasion. There are noxious weeds in the general area, and mining provides an avenue for their expansion. Weeds would need to be controlled within all project disturbances. Permits issued for mining or related activities would contain requirements specific to control of weeds such as use of weed-free mulch and straw, revegetation of disturbed areas with native seed mixes, periodic noxious weed surveys of mining operations. These types

of mitigation measures would reduce the noxious weed problem to a manageable level during the life of any mine.

4.4.14 EFFECTS ON WILDLIFE/FISHERIES HABITAT AND THREATENED AND ENDANGERED SPECIES

4.4.14.1 Wildlife

Local wildlife populations would be directly and indirectly impacted by mining activities occurring on private/state and public lands. These impacts would be short-term (until reclamation is achieved) and long-term (persisting beyond successful completion of reclamation). Coal mining-related direct impacts on wildlife would depend on how many total acres would be mined, the exact location, the sequence of mining, the method of mining, and the rate of reclamation. Under the reasonably foreseeable development scenario, surface mining of federal reserves would affect an additional 200 acres of potential wildlife habitat within the planning review area and would extend the duration of impacts resulting from mining activities.

Mining activity on private/state and public lands would cause additional stress to wildlife. How well wildlife acclimate to the increased activity would depend on location and timing of activity, existing stress levels caused by environmental factors, and wildlife ability to move to other less-developed areas.

Mining activity may cause the displacement of wildlife species to other areas. When animals are displaced, they may find equally suitable habitat that is not occupied by other animals, occupy suitable habitat that is already being used, or occupy poorer habitat than that from which they were displaced. In the second and third situations, displaced animals suffer from increased competition with other animals and are less likely to survive and reproduce. The consequences are often difficult to quantify because other factors such as annual rainfall and snowfall depths influence animal population and mortality. Small, less mobile animals may be less likely to relocate and may be killed during construction and development activities. Due to the large, diverse habitat available and the scattered nature of disturbance throughout the area, impacts to small animals would be minimal.

Direct impacts to wildlife would occur from construction and mining activities that would create barriers that restrict animal movement such as fences, spoil piles, and pits. Wildlife would also be directly affected as a result of vehicle/wildlife collisions caused by increased traffic.

The small percentage of land actually disturbed on a yearly basis would not reduce the local habitat at such a rate that wildlife species could not adjust to the reduction in habitat. Populations may be somewhat suppressed during the life of mining but would be able to repopulate mined areas following reclamation.

The use of appropriate shrub species in reclamation seed mixes greatly reduces the impact of habitat conversion in the long term.

Big Game Habitat

A total of 4160 acres of big game habitat would be potentially impacted by windpower development and the development of surface minable coal on lands of all ownerships in the planning review area. The direct impacts of habitat loss resulting from the development of federal mining and associated ancillary facilities, and other existing disturbance is quantifiable, and the significance of this loss can be estimated. However, the quantification of impacts of such influences as noise, visual disturbance, human activity, and changes in snow deposition on wildlife behavior and habitat use is difficult.

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Noise, dust, and associated human presence may cause some local avoidance of foraging areas adjacent to mining activities; however, big game animals are highly mobile and can move to undisturbed areas if unrestricted. Many big game species continue to occupy areas adjacent to mining operations.

Mitigative measures would be combined with appropriate mining methods to reduce the impacts of mining in antelope and deer crucial winter ranges within the planning review area in order to maintain a long-range balance between habitat needs and coal development. These mitigative measures would be developed during coal leasing and permitting to address specific situations.

The amount of crucial habitat removed from a given herd unit by development activities is a quantifiable measurement of impacts to habitat function. The KENETECH EIS describes disturbance to crucial habitat for elk, deer (whitetail deer and mule deer), and pronghorn antelope. Because only mule deer and antelope crucial winter range exists within the planning review area whitetail deer and elk will not be discussed. The acreages presented below are for the amount of habitat actually disturbed. Increased human activity, vehicle traffic, and noise would all combine to increase the area avoided by wildlife. The increased habitat avoided by wildlife is not anticipated to be significant as animals over time habituate to routine sounds and activity.

The planning review area contains portions of two big game crucial winter ranges: approximately 25,700 acres (11.3%) of crucial winter range within the Medicine Bow pronghorn herd unit and approximately 5,700 acres (3.6%) of crucial winter range within the Sheep Mountain mule deer herd unit. Existing crucial habitat disturbance for the entire herd unit is 9,029 acres (4.0%) for the Medicine Bow herd unit and 4,491 acres (2.8%) for the Sheep Mountain herd unit (USDI, 1995). The estimated increase in disturbance of crucial winter range from the addition of federal coal reserves within the Medicine Bow pronghorn herd unit would be approximately 1.7%, for a total disturbance of 11,829 acres (5.2% of the herd unit) the estimated increase in disturbance of crucial winter range within the Sheep Mountain mule deer herd unit would be approximately 3.4%, for a total disturbance of 6,033 acres (3.8% of the herd unit). Estimated disturbance attributed to additional federal coal development in the planning review area are (2,660 acres for the Medicine Bow herd unit and 1,500 acres for the Sheep Mountain herd unit). These estimates are of total disturbance over the life of reasonably foreseeable mining and do not account for the fact that mining would occur sequentially.

A conservative estimate of disturbance at peak mining of 240 acres per year followed by subsequent reclamation over the 11-12 year life of a mine would substantially reduce the impact presented above.

Non-Game Mammals

Impacts to small mammals as a result of the addition of federal coal mining would occur primarily from additional habitat disturbance. Direct losses to small mammals would be higher than for other wildlife since the mobility of small mammals is limited and many would retreat to burrows when disturbed. Mammals such as coyotes and rabbits would be temporarily displaced to other habitats while mining occurs and would return following reclamation. Populations of less mobile animals such as mice would decline during mining. However, these animals generally have a high reproductive potential and tend to re-invade and adapt to reclaimed areas quickly.

4.4.14.2 Game Birds

Sage grouse are the only game bird that would be impacted by development in the planning review area. Five known sage grouse leks exist within the planning review area. The protection of critical nesting habitat

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associated with sage grouse strutting grounds is essential. Habitat can be protected by restricting disturbance to the area during the critical nesting period. The additional development of federal coal reserves under the reasonably foreseeable development scenario would increase the level of disturbance from mine-related activities from 800 acres to 1,000 acres (3.1%) of potential nesting habitat within the planning review area. The actual disturbance would be less at any point in time as habitat is reclaimed during sequential mining.

It was determined that sage grouse habitat areas are acceptable for coal leasing and development with stipulations and mitigation requirements for habitat improvement, development and reclamation. Mitigation measures such as spatial and temporal restrictions on mining activity (See Coal Appendix) would reduce impacts to wildlife during critical times of the year. Sage grouse breeding and nesting habitat buffer zones and winter range timing restrictions would be addressed during coal leasing and permitting to address specific situations.

Some additional disturbance to sage grouse nesting habitat is likely to occur due to roads, powerlines, or wind turbines associated with the windpower project. However, the best information available indicates that the area of overlap for the Carbon Basin planning review area and the windpower project area is the least likely location for placement of wind turbines. Habitat would be re-established where areas disturbed by windpower construction are reclaimed.

4.4.14.3 Non-Game Birds

Impacts to avian species as a result of the addition of federal coal mining would occur primarily from additional habitat disturbance.

Raptor species are of particular concern as they show great sensitivity to disturbance during the nesting season. Impacts to raptors depend on species distribution, population size, habitat preference, foraging areas, etc. Federal coal mining would add to the impact to raptor populations in the planning review area through loss of foraging habitat and nesting sites.

Using the most recent data, three golden eagle nests and one prairie falcon nest, are located on federal coal lands in the planning review area are likely to be affected by surface mining activities (see Figure 3.5). Mining related disturbance could cause these raptors to abandon nests. Surveys would be completed prior to coal leasing for golden eagle roosts and nests, falcon nesting sites, and birds protected under the Migratory Bird Treaty Act.

A Biological Assessment would be prepared in conjunction with the EIS or EA that is prepared prior to issuing federal coal leases. Stipulations would be placed on coal leases to assure lessee compliance with all mitigative measures developed as a result of the BA. Mitigative measures may include, but would not be limited to, seasonal operations in some areas, buffer zones around occupied nests, protection of active (not necessarily occupied) nests at all times (unless otherwise provided by USFWS), off- or on-site habitat (within the lease) improvement or development, special reclamation measures, or other appropriate measures for long-term habitat protection.

Foraging habitat for raptors would be reduced in the area until revegetation successfully attracts small mammals, which serve as their prey.

4.4.14.4 Fisheries

No fisheries resources would be physically disturbed by any activity related to federal coal mining. The only impact that may affect the fisheries in the area would be increased sediment to the Medicine Bow River in the southeast section of the planning review area. This area would receive special attention during any mine permitting process to assure that the integrity of the floodplain and riparian area is maintained.

4.4.14.5 Threatened and Endangered/State Sensitive Species**Threatened and Endangered Species**

The Bureau of Land Management policy is to conserve T&E species and the ecosystems in which they depend. In addition, the BLM shall use existing authority in furthering the purpose of the ESA. The policy is to ensure that actions authorized on BLM-administered lands do not contribute to the need to list any other Special Status Species under the provision of the ESA (BLM Manual 6840).

The Endangered Species Act (16 U.S.C. 1531-1543) protects listed T&E plant and animal species and their critical habitats. Surveys for T&E and candidate species have been conducted in conjunction with the SeaWest/Pacificorp windpower project in the Simpson Ridge area located partially within the planning review area. The following species would be a priority when surveys are conducted within the area: black-footed ferret, peregrine falcon, bald eagle, swift fox, whooping crane, and the mountain plover. Formal consultation with the USFWS would be implemented and further guidelines would be developed for any mitigation or protection measures.

Mammals

According to USFWS the direct impact to potential BFF habitat would be the loss of available prey due to surface disturbance by coal mining. If black-tailed prairie dog colonies or complexes greater than 79 acres or white-tailed prairie dog colonies or complexes greater than 200 acres would be disturbed, surveys for ferrets would be conducted.

Prairie dog colonies that could provide a potential prey base and suitable habitat for BFFs, are scattered throughout the area. Any required surveys for prairie dog complexes would be part of any federal coal lease that may be issued in the area (see the Requirements and Mitigation section of the Coal Appendix).

Any habitat loss due to coal development would be mitigated through reclamation and off- or on-site habitat development within the lease. Project costs could increase by mitigation of high priority habitat losses in coal development areas.

No recent sightings of swift fox have been reported in, or near the planning review area. Direct impacts that may occur would be loss of potential prey: small mammals, insects, and birds due to surface disturbance by coal mining. Surveys conducted prior to denning would reduce the chance that den sites would be destroyed during mining. The absence of large areas of suitable habitat would reduce the likelihood that this species would be impacted by development in the planning review area. Reclamation methods used to return mined areas to pre-disturbance vegetation would reduce long-term effects on this species. Sequential mining and reclamation would be progressive, thus reducing the amount of disturbed habitat at any time.

Birds

Reclamation methods used to return mined areas to pre-disturbance vegetation would reduce long term effects on this species. Sequential mining and reclamation would be progressive, thus reducing the amount of disturbed habitat at any given time.

Bald eagles using the Medicine Bow River corridor for roosting and foraging activities may infrequently visit the planning review area. The additional development of federal coal would further reduce habitat for prey species utilized by the bald eagle. Prior to coal leasing, surveys would be conducted for bald eagle roosts and nests. If a bald eagle roost or nest is discovered during these surveys, protection measures such as seasonal operations, buffer zones around occupied nests, protection of active (not necessarily occupied) nests at all times (unless otherwise provided by USFWS), off- or on-site (but on lease) habitat improvement or development, special reclamation measures, or other appropriate measures to ensure long-term habitat protection would be required.

Direct impact to the peregrine falcon would be loss of available prey where small birds and waterfowl avoid the planning review area as a result of disturbance. The impact would be minimal due to the lack of suitable riparian and aquatic habitat in the planning review area.

The overall impact to the mountain plover would be additional loss of suitable nesting habitat due to federal coal mining. Prior to leasing federal coal, surveys would be conducted to determine the presence and distribution of the mountain plover in the planning review area and appropriate mitigation would be developed and required.

Impacts to ferruginous hawks from federal coal mining would include additional loss of habitat for prey species which include small to medium-sized mammals such as jackrabbits, cottontails, ground squirrels, and prairie dogs (Sherrod, 1978). Surveys would be conducted prior to coal leasing to determine the status of ferruginous hawk nests in the planning review area. Based on the results of these surveys, coal lease requirements may include mitigation measures to protect the long-term interest of the species including habitat improvement, development, and reclamations plans. Seasonal restrictions and buffer zones may also be required. The impact would be reduced as reclamation returns disturbed areas to near pre-mining vegetation that successfully attracts small mammals which serve as prey.

Direct impacts to loggerhead shrikes would be the removal of small mammals and their burrows within the planning review area and the removal of the necessary vegetation that is used for nesting. Surveys would be conducted prior to leasing and development, but because of the small amount of loggerhead shrike nesting habitat in the planning review area, coal mining is anticipated to have a negligible impact.

Due to the lack of recorded observations for the planning review area, it is unlikely that impacts to burrowing owls would occur.

State Sensitive Species of Concern**Mammals**

No roosts for any state sensitive bat species have been found in the planning review area.

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Birds

Habitat for the twenty Wyoming bird species of concern may be disturbed by federal coal mining. Potential impacts to any of these species would be evaluated on federal coal lands prior to leasing.

4.4.15 Effects on Socio-Economic Consideration

The extraction of federal coal reserves would increase the life of mining over the long term. The additional federal coal available for leasing and development would provide the opportunity for the mining related workforce currently employed in the Hanna Basin to remain employed in Carbon County for an additional 1-2 years under the reasonably foreseeable development for surface mining described in Alternative 1. The availability of federal coal in the Carbon Basin would not, by itself, provide the reserves necessary to retain the current Hanna Basin mining infrastructure. The federal coal would however, extend the life of mining in the region where surface mining is conducted and make underground mining feasible in other areas where the checkerboard land pattern would otherwise preclude the underground mining of alternate sections. The potential income from the bonus bid, future royalties, and taxes on approximately 313 million tons of federal coal could be realized.

The additional development of federal coal reserves would not change the need for a coal transportation workforce. The federal coal would extend the life of mining over mining of private/state coal alone and extend the term of employment for the 40 workers required to transport coal. This would add approximately \$2 5-3 0 million per year in direct salaries to the economy of Carbon County over the additional 1-2 year life of mining under the reasonably foreseeable development scenario in Alternative 1.

Current community infrastructure in the towns of Hanna, Medicine Bow, and Elk Mountain is expected to be sufficient to handle the potential increase in population caused by increasing the transportation workforce for one new mine. The development of other mines within the planning review area would put some additional pressure on local services and facilities as additional workers are hired and the population moving into the county grows. In response, employment in the government sectors and service sectors would correspondingly increase. The additional mining related workforce salaries, taxes, etc., would be expected to provide the revenue required to support the additional government related services.

4.4.16 EFFECTS ON ENVIRONMENTAL JUSTICE

The leasing and development of federal coal would have no affect on the social, cultural, and economic well-being, and health of minorities and low income groups within the planning area.

4.4.17 EFFECTS ON HEALTH/SAFETY

No increase in vehicle accidents in the short term would be expected due to mining federal coal reserves. The increase in vehicle accidents due to the addition of coal haul trucks on local roads would extend an additional 1-2 years under the reasonably foreseeable development scenario of Alternative 1. With proper driver training and observance of posted speed limits, the increased level of accidents is expected to be minimal. Private vehicle traffic is not anticipated to change as a result of federal coal mining in the planning review area. As activity is reduced at the Medicine Bow Mine after the year 2000, activity would increase at the proposed mine in the Carbon Basin. Local health and law enforcement infrastructure currently in place is adequate to handle activity related to the mines in the Hanna Basin. It is anticipated that mining activity in the Carbon Basin would not occur before Arch of Wyoming's Medicine Bow Mine in the Hanna Basin ceases production. Few additional services would be required to handle mining activity within the area once the Medicine Bow mine in the Hanna Basin closes down.

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With coal production activities currently occurring in the Hanna Basin to the north, mine-related accidents, highway traffic, and health needs are currently being handled by existing services in the towns of Hanna, Medicine Bow, and Rawlins.

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5.0 CONSULTATION AND COORDINATION

5.1 MANAGEMENT TEAM

The Wyoming State Director of the BLM was assigned the lead responsibility for preparation of this Great Divide Resource Management Plan Review. Primary responsibility for preparation of this document was shared between the BLM Wyoming State Office and the Rawlins District- Great Divide Resource Area.

Two separate teams developed parts of the analysis. The Coal Planning Team completed the Coal Screening Process required under the coal regulations at 43 CFR 3420 and 3461. The Interdisciplinary Planning Team prepared the environmental assessment.

5.2 COAL PLANNING TEAM

<u>NAME</u>	<u>ASSIGNMENT/POSITION</u>
Bob Janssen - WSO	Determination of coal potential
Krystal Clair	Recreation, visual resources, unsuitability and multiple use conflict review
Sandra Meyers	Cultural resources, natural history, Native American concerns, unsuitability and multiple use conflict review
Marilyn Roth	Land use, identify ROW's, easements, unsuitability and multiple-use conflict review
Susan Foley	Soils, water, floodplain and AVF identification, unsuitability and multiple-use conflict review
Ann Watson	Wetland/Riparian Area identification, unsuitability and multiple-use conflict review Resident species habitat, T&E species, unsuitability and multiple use conflict review
Sarah Crocker	Vegetation and agricultural, unsuitability and multiple use conflict review
Dave McWhirter	Surface and groundwater, unsuitability and multiple-use conflict review

5.3 INTERDISCIPLINARY PLANNING TEAM

5.3.1 Management Team

<u>NAME</u>	<u>ASSIGNMENT/POSITION</u>
Al Pierson	Review and approval
Kurt Kotter	Review and recommendation
Karla Swanson	Review and recommendation

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5.3.2 Project Coordinators

NAME	ASSIGNMENT/POSITION
Brenda Vosika Neuman John Spehar Joe Patti - WSO	Responsible for IDT coordination, coordination between District and State Office, review public comments, co-author EA and planning document, review and release any public information.

5.3.3 Interdisciplinary Planning Team

NAME	ASSIGNMENT/POSITION
Krystal Clair Joe Patti - WSO Mark Goldbach - WSO	Recreation, visual resources, Wild and Scenic River review
Sarah Crocker	Vegetation and agriculture
Ken Henke	Air quality and noise impacts, Hazardous materials
Susan Foley	Soils, floodplain, AVF identification
Sandra Meyers Gary DeMarcey	Cultural resources and natural history, Native American religious concerns
Marilyn Roth	Land use
Mark Newman	Fluid and solid mineral occurrence
Ann Watson	Wetland/riparian area review
John Spehar Roy Allen - WSO	Social and economic effects on local communities
Dave McWhirter	Surface and groundwater impacts
Tim Nowak - WSO	Environmental justice
Lynn McCarthy Gloria Robinson	Maps, figures, and illustrations
Missy Cook	Clerical Support

ENVIRONMENTAL ASSESSMENT - Carbon Basin Area

6.0 REFERENCES

- Allen, J.N. 1980. The ecology and behavior of the long-billed curlew in southeastern Washington. Wildlife Monographs 73 1-67.
- Behle W.H., and M.L. Perry. 1975. Utah birds. Utah Museum of Natural History. Salt Lake City, Utah.
- Borden, George W., R. Fletcher, D. Taylor. 1994. Economic Impact of Coal on Wyoming's Economy Prepared for the Bureau of Land Management. University of Wyoming Cooperative Extension Service. B-987.
- Bureau of the Census. 1992. 1990 Census of Housing, general housing characteristics, Wyoming (1990 CH-52). Superintendent of Documents, U.S. Government Printing Office, Washington, D.C.
- Bureau of Economic Analysis. 1994. Regional Economic Information System. Bureau of Economic Analysis, Washington, D.C.
- Bureau of Land Management. 1977. Hanna Unit Management Framework Plan. U.S. Department of the Interior, Bureau of Land Management.
- _____. 1979. Final Environmental Statement, Proposed Coal Leasing in Carbon Basin Area, Wyoming. U.S. Department of the Interior, Bureau of Land Management.
- _____. 1980. Technical Report On Climate And Air Quality For The Green River Hams Fork Region Environmental Impact Statement. U.S. Department of the Interior, Bureau of Land Management.
- _____. 1981. Air Quality Assessment Study For The Powder River Basin Regional Environmental Impact Statement. U.S. Department of the Interior, Bureau of Land Management.
- _____. 1983. Green River-Hams Fork Round Two Coal Leasing EIS. Technical Report on Regional Climate and Air Quality. U.S. Department of the Interior, Bureau of Land Management.
- _____. 1987. Draft Resource Management Plan/Environmental Impact Statement for the Medicine Bow - Divide Resource Area, Rawlins District, Wyoming, BLM-WY-ES-87-008-4410. U.S. Department of the Interior, Bureau of Land Management. 500 pp.
- _____. 1988. National Environmental Policy Act, Handbook H-1790-1. U.S. Department of the Interior, Bureau of Land Management.
- _____. 1995. Draft KENETECH/Pacificorp Windpower Project EIS. U.S. Department of the Interior, Bureau of Land Management.
- _____. 1995. Final Environmental Impact Statement, KENETECH/Pacificorp Windpower Project, Carbon County, Wyoming. U.S. Department of the Interior, Bureau of Land Management.
- _____. 1997. Environmental Impact Statement, Seawest/Pacificorp Windpower Project, Carbon County, Wyoming. U.S. Department of the Interior, Bureau of Land Management.

ENVIRONMENTAL ASSESSMENT - Carbon Basin Area

- Call, M.W. 1978. Nesting habitats and surveying techniques for common western raptors. U.S. Department of the Interior. Bureau of Land Management. Technical Note No. 316. 115 pp.
- Clark, T.W. and M.R. Stromberg. 1987. Mammals in Wyoming. University of Kansas. Museum of Natural History. Public Education Series No. 10. 314 pp.
- Deblinger, R.D. 1988. Ecology and Behavior of Pronghorn in the Red Desert, Wyoming, with reference to energy development. Ph.D. Dissertation. Colorado State University. Fort Collins, Colorado. 227 pp.
- Dinsmore, J.J. 1983. Mountain plover (*Chondestes montanus*). Pages 185-196. In J.S. Armbruster (ed.), Impacts of coal surface mining on 25 migratory bird species of high federal interest. Department of the Interior, U.S. Fish and Wildlife Service, FWS OBS-83-85. 348 pp.
- Dorn, J.L. and R.D. Dorn. 1990. Wyoming birds. Mountain West Publishing, Cheyenne, Wyoming. 138 pp.
- Edwards, C.C. 1969. Winter behavior and population dynamics of American Eagles in Utah. Ph.D. Dissertation. Brigham Young University, Provo, Utah. 156 pp.
- Evans, D.L. 1983. Ferruginous hawk (*Buteo regalis*). Pages 109-123. In J.S. Armbruster (ed.), Impacts of coal surface mining on 25 migratory bird species of high federal interest. Department of the Interior, U.S. Fish and Wildlife Service, FWS OBS-83-85. 348 pp.
- Forrest, S.C., T.W. Clark, L. Richardson, and T.M. Campbell III. 1985. Black-footed Ferret Habitat: Some management and reintroduction considerations. Wyoming Bureau of Land Management Wildlife Technical Bulletin No. 2. 49 pp.
- Glass, Gary B. and J.T. Roberts. 1979. Structure, Coal Thickness, and Shallow Overburden for the Carbon No. 6, Carbon No. 5, and Johnson Coal Beds in the Carbon Mining District, Hanna Coal Field, Southcentral Wyoming. Open File Report 79-2. Geologic Survey of Wyoming, Laramie, Wyoming.
1979. Structure, Coal Thickness, and Shallow Overburden for Coal Beds No. 109, No. 105, Carbon No. 4, and Johnson Rider in the Carbon Mining District, Hanna Coal Field, Southcentral Wyoming. Open File Report 79-3. Geologic Survey of Wyoming, Laramie, Wyoming.
1979. Structure, Coal Thickness, and Shallow Overburden for Finch Coal Bed in the Carbon Mining District, Hanna Coal Field, Southcentral Wyoming. Open File Report 79-4. Geologic Survey of Wyoming, Laramie, Wyoming.
1980. Coals and Coal-Bearing Rocks of the Hanna Coal Field, Wyoming. Report of Investigations No. 22. Geological Survey of Wyoming, Laramie, Wyoming.
- Graul, W.D. and L.E. Webster. 1976. Breeding status of the mountain plover. Condor 78:265-267.
- Guenzel, R.J. 1986. Pronghorn Ecology in Southcentral Wyoming. M.S. Thesis, University of Wyoming, Laramie. 347 pp.
- Hayden, H.J. 1966. Geological Map of the McFadden Quadrangle, Carbon County, Wyoming. U.S. Geological Survey.

ENVIRONMENTAL ASSESSMENT - Carbon Basin Area

- Howe, M.A. 1983. Long-billed curlew (*Numenius americanus*). Pages 197-211. In J.S. Armbruster (ed.), Impacts of surface coal mining on 25 migratory birds of high federal interest. Department of the Interior, U.S. Fish and Wildlife Service, FWS OBS-83-85. 348 pp.
- Jobman, W.G. 1992. Potential Present Range of the Black-footed Ferret. Update (updated black-footed ferret observations from 1981 to present). Department of the Interior, U.S. Fish and Wildlife Service, Grand Island, Nebraska.
- Lageson, D.R. and D.R. Spearing. 1988. Roadside Geology of Wyoming. Mountain Press Publishing Company, Missoula, Montana. 273 pp.
- Mariah Associates, Inc. 1994. Unpublished wildlife observation data for the Kenetech Pacificorp Windpower Project.
1995. Written communication from G. Heller (Mariah Associates, Inc.) to S. Brockman in response to a request for a list of Threatened, endangered, and candidate animal and plant species to be addressed in the Biological Assessment for the Kenetech Pacificorp Windpower Project. January 23, 1995.
- Mesilla Valley Engineers. 1978. Hydrologic Report for the Medicine Bow Project. Mesilla Valley Engineers, Mesilla Park, N.M.
- Office of Surface Mining Reclamation and Enforcement. 1980. Noise Impact Assessment for Rojo Caballos Mine. Unpublished report prepared by James M. Montgomery, Consulting Engineers, Inc. Aurora, Colorado.
- Pedersen Planning Consultants. 1997. Personal communication with Jim Pedersen. July, 1997.
- Peterson, A. 1986. Habitat suitability index models: Bald eagle (breeding season). U.S. Fish and Wildlife Service Biological Report 82 (10.126). 125 pp.
- Sheets, R.G., R.L. Linder, and R.B. Dahlgren. 1972. Food Habits of Two Litters of Black-footed Ferrets in South Dakota. American Midland Naturalist. 87:249-251.
- Sherrod, S.K. 1978. Diets of North American Falconiformes. Raptor Research 12 (3-4): 49-121.
- Snow, C. 1972. Habitat management series for endangered species. Report No. 1. American peregrine falcon (*Falco peregrinus anatum*) and arctic peregrine falcon (*F. p. tundrus*). U.S. Department of the Interior, Bureau of Land Management, Technical Note No. 167. 35pp.
1973. Habitat management series for endangered species. Report No. 5. Southern bald eagle (*Haliaeetus leucocephalus leucocephalus*) and northern bald eagle (*H. l. alascanus*). U.S. Department of the Interior, Bureau of Land Management, Technical Note No. 171. 58 pp.
- Steenhof, K. 1978. Management of wintering bald eagles. U.S. Fish and Wildlife Service, FWS OBS-78/79. 59 pp.
- U.S. Fish and Wildlife Service. 1988. Black-footed Ferret Recovery Plan. U.S. Fish and Wildlife Service, Denver, Colorado. 154pp.

ENVIRONMENTAL ASSESSMENT - Carbon Basin Area

- Van Voast, W.A. and Reiten, J.C. 1988. Hydrogeologic Response - Twenty Years of Surface Coal Mining in Southeastern Montana. Montana Bureau of Mines and Geology Memoir 62.
- Wilderness Research Institute. 1979. A peregrine falcon nesting habitat survey in Shasta-Trinity National Forest. Wilderness Research Institute, Arcata, California. 22pp.
- Wyoming Department of Employment. 1996. Where are the Jobs? What do they pay? Employment Resources Division, Wyoming Department of Employment.
- Wyoming Division of Economic and Community Development. 1993. 1993-1994 community profiles. Wyoming Division of Economic and Community Development, Cheyenne, Wyoming.
- Wyoming Game and Fish Department. 1991. Wyoming Trout Stream Classification Map. Wyoming Game and Fish Department, Cheyenne, Wyoming.
- _____. 1992. Wyoming Bird and Mammal Atlas. Biological Services, Game Division, Wyoming Game and Fish Department, Cheyenne, Wyoming. 170pp.
- _____. 1994. Wyoming observation system records. Biological Services, Wyoming Game and Fish Department, Cheyenne, Wyoming.
- Wyoming Game and Fish Department and Bureau of Land Management. 1991. A Cooperative Management Plan for Black-footed Ferrets, Shirley Basin Medicine Bow, Wyoming. Prepared by the Shirley Basin Medicine Bow Black-footed Ferret Working Group. Published by Wyoming Game and Fish Department, Cheyenne, Wyoming.
- Yoakum, J.D. 1978. Pronghorn. Pages 103-121 In J.L. Schmidt and D.L. Gilbert (eds). Big Game of North America: Ecology and Management. Stackpole Books, Harrisburg, Pennsylvania. 494pp.

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APPENDIX 1

COAL SCREENING PROCESS SUMMARY

INTRODUCTION

The Great Divide Resource Management Plan (RMP) signed in 1990 did not take into consideration federal coal reserves present in the Carbon Basin Coal Area and did not include a planning decision identifying any federal coal in the basin that is acceptable for leasing consideration. The reasons for this are (1) a large portion of the federal coal in the area was under lease at the time and was, therefore, exempt from application of the coal unsuitability criteria and, in general, from the coal screening/planning requirements (43 CFR 3461), and (2) there were no interests expressed at the time in leasing the remaining unleased federal coal in the area.

On September 10, 1996, the Bureau of Land Management received a coal lease application from Ark Land Company to lease approximately 4,145 acres of federal coal lands in the Carbon Basin Coal Area, Carbon County, Wyoming. According to the Federal Coal Leasing Amendments Act of 1976, a federal coal lease sale cannot be held unless the lands containing the federal coal deposits have been included in a comprehensive land use plan. Since the Great Divide RMP is silent on the acceptability of this area for further federal coal leasing consideration, and in response to Ark Land Company's application, the four step coal screening planning process will be conducted on the area to determine if any of the federal coal lands are acceptable for leasing consideration. As a result of this process, the Great Divide RMP may be amended accordingly.

The planning review (coal screening process) will be restricted to only the Carbon Basin area. The review will be consistent with the Federal Coal Management Program, policies, environmental integrity, national energy needs, and related demands. Conducting the environmental analysis and developing the environmental assessment will serve as a mode for public input to the coal screening/planning process.

CONSULTATION AND COORDINATION

On November 22, 1996, a Federal Register Notice of Intent to conduct a planning review on the Carbon Basin area and to prepare an environmental impact statement (EIS) on the Ark Land coal lease application was published. The notice included a call for any available coal and other resource information for the planning review area. No specific information was received as a result of this notice.

UNSUITABILITY CRITERIA

Comments were received from U. S. Fish and Wildlife Service, Wyoming Game and Fish Department as required under the consultation requirement of the coal unsuitability criteria (43 CFR 3461).

AREA DESCRIPTION

The Carbon Basin area lies within a portion of the decertified Green River-Hams Fork Coal Region which includes coal in south-central Wyoming and is shown on Figure 1.1A.

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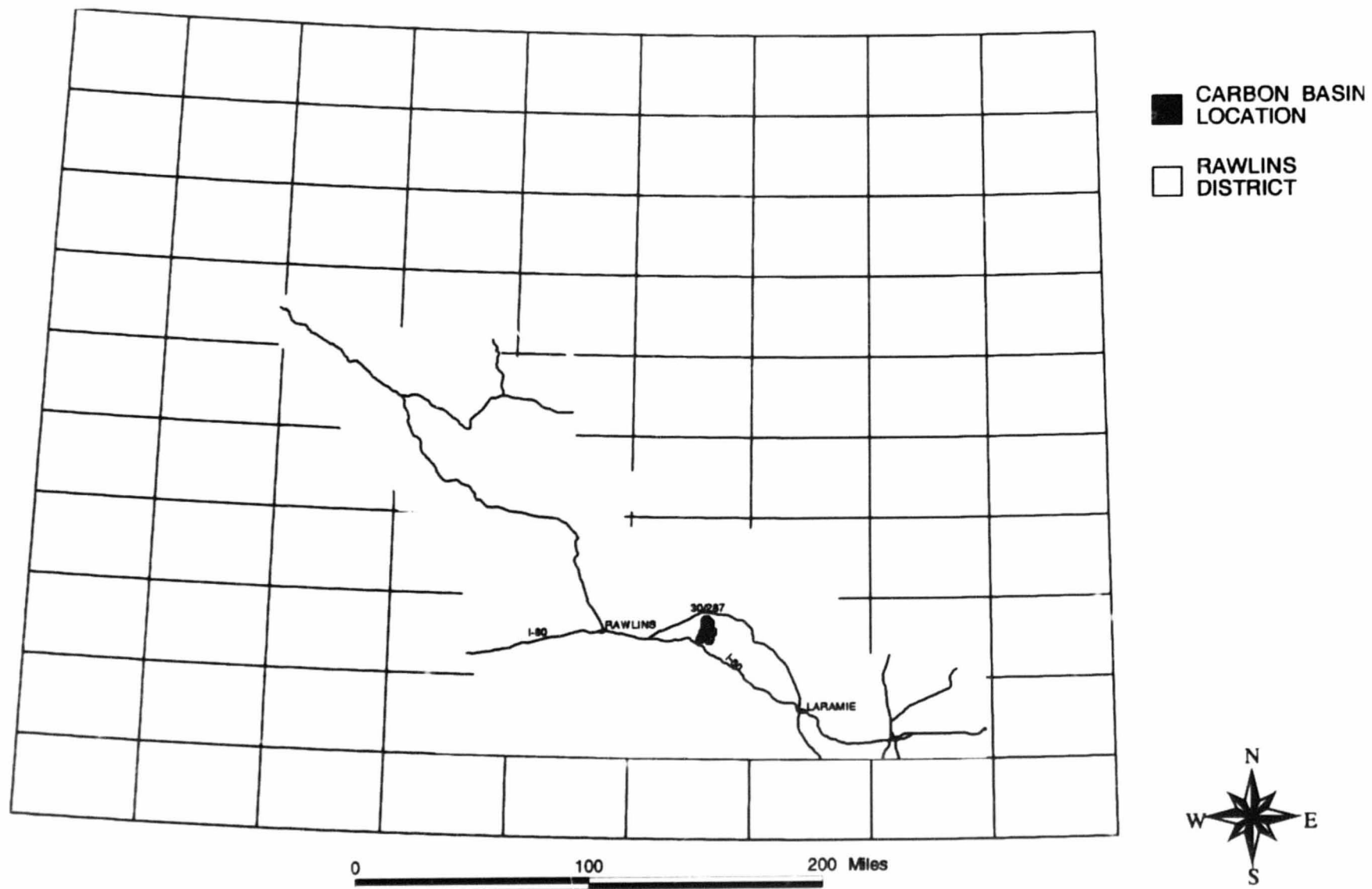


Fig. 1.1A CARBON BASIN AREA LOCATION MAP

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The first commercial development of coal in the Carbon Basin area was near the town of Carbon in 1868. By 1888 coal mining interest shifted to the nearby town of Hanna. Edison Development Company held a federal coal lease in the Carbon Basin from 1982 through 1992. No development took place under this lease before it expired.

The Carbon Basin is a relatively shallow geologic basin separated from the Hanna Basin to the west by Simpson Ridge. Potentially minable coals are found in the Tertiary Hanna Formation, which is exposed at the surface in the Carbon Basin. Estimates of shallow coal reserves and resources in the Carbon Basin existing between 0 and 200 feet are estimated to be approximately 120 million tons of coal. Subsurface reserves have been conservatively estimated to be 768 million tons between 200 and 1,000 feet deep.

Although several coal seams exist, the one most attractive to mining is the Johnson seam, with an average thickness of 13.66 feet. The coal contains an average of 11,280 British Thermal Units of energy per pound (BTU/lb) and an average sulfur content of 0.60 percent. The Finch seam, located stratigraphically above the Johnson seam, may also be minable, with an average thickness of 8 feet, an average of 11,450 BTU/lb, and a sulfur content of 0.50 percent.

The area has a checkerboard coal and land ownership pattern with alternating sections of federal and non-federal coal lands. Figure 1.2A shows the land and coal ownership status in this area.

In some cases, the land and coal ownership in the area is split (i.e., split estate). There are areas of state or privately-owned land surface overlying federally-owned coal. Only the areas containing federally-owned coal within the Carbon Basin Area were reviewed and evaluated.

COAL SCREENING/PLANNING PROCEDURES

The Federal Coal Management Program established four major steps to be used in the identification of federal coal areas that are acceptable for coal development. The four steps are (1) identification of areas with federal coal development potential; (2) application of the coal unsuitability criteria; (3) other multiple use conflicts evaluation; and (4) surface owner consultation. Application of the latter three coal screening steps, as described below, results in (1) identifying areas that are acceptable for coal development in each of these three steps, and (2) identifying areas that are unsuitable (Step 2), unacceptable (Step 3), and unavailable (Step 4) for coal development. Finally, all federal coal areas that pass through the screening process are determined to be acceptable for further consideration for leasing and development. Collectively these steps are called the "Coal Screening Process" (43 CFR 3461) and are applied in sequence to the federal coal review area.

Special Note: Under the No Action - Continuation of Present Management - Alternative, none of the Federal coal in the review area would be open to consideration for leasing and development. Thus, it is not appropriate to conduct the coal screening/planning process on that alternative. Under other circumstances, the application of the Coal Unsuitability Criteria (Step 2, described below) would be conducted to help formulate each of two alternatives with two differing perspectives: (1) strict application of the criteria with no consideration of the exceptions; and (2) application of the criteria with consideration of the exceptions. As explained in section 2.3 of this EA, applying the criteria with no consideration of the exceptions would eliminate all Federal coal lands in the review area from further consideration for leasing and development. Thus, to analyze that alternative in detail would be a redundant and unnecessary exercise, because no leasing and development of federal coal in the planning review area are adequately addressed under

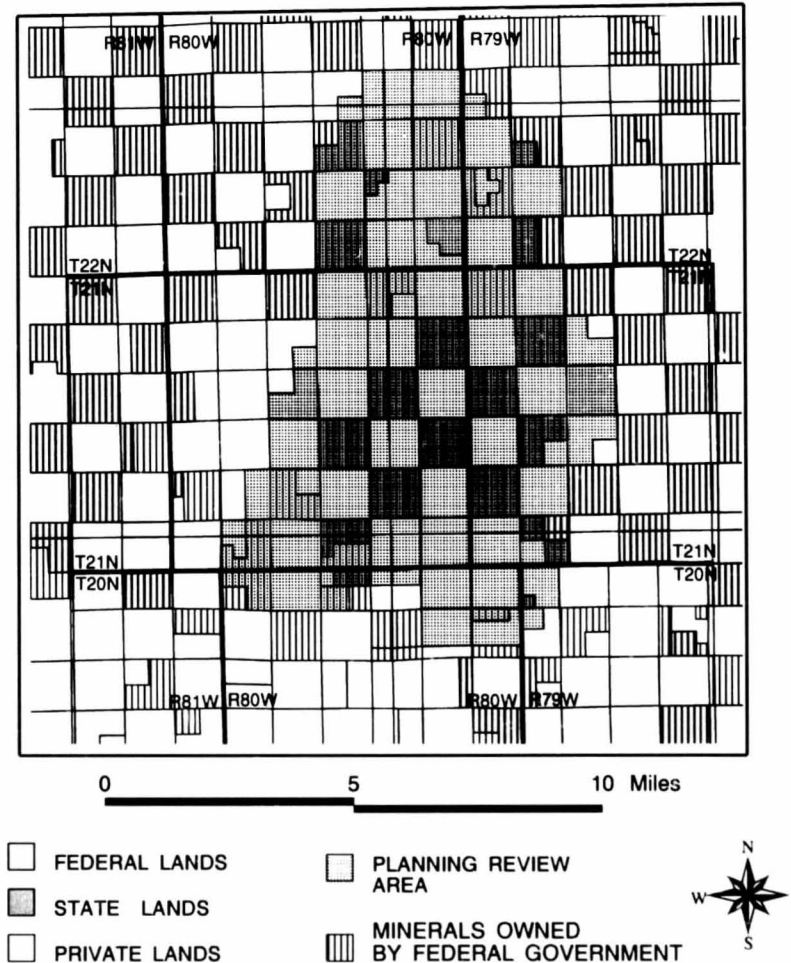


Fig. 1.2A LAND STATUS MAP

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the No Action Alternative. Therefore, it was only necessary to apply the Coal Unsuitability Criteria, with consideration of the exceptions, and to conduct the remainder of the coal screening planning process on Alternative 2.

The following is a description of each of the steps of the coal screening process and how they were applied to the Carbon Basin Coal Area.

Step 1 - Identification of Coal Development Potential

As stated above, potentially minable coals in the Carbon Basin are found in the Hanna Formation. Rocks within the Hanna Formation are extremely variable, containing everything from massive cross-bedded conglomeratic sandstones to shales, claystones, and coal. Development potential for both surface and subsurface mining methods were identified using geologic information provided by the Geologic Survey of Wyoming. The remaining three screening steps were applied to the Federal coal development potential areas (both known and assumed) identified in the Carbon Basin Area (see Fig 1.3A).

Step 2 - Application of Coal Unsuitability Criteria

As required by 43 CFR 3461, the 20 unsuitability criteria were applied to all known and assumed federal coal lands with development potential in the Carbon Basin area.

These criteria involve consideration of existing resource values such as scenic areas, natural and historic values, wildlife, floodplains, alluvial valley floors, etc. The purpose of this step is to identify areas with key features of environmental sensitivity that would make them unsuitable for surface coal mining, or for the surface impacts associated with coal mining.

Step 3 - Multiple Use Conflict Evaluation

This step is a review of those federal coal lands that remain acceptable after applying the coal unsuitability criteria. It involves consideration of other multiple use values (i.e., not directly concerned with the unsuitability criteria) and identifying any areas that would be unacceptable (in addition to those identified as unsuitable) for surface or subsurface coal mining or for surface operations and impacts associated with coal mining. The basis for making this determination is the environmental analysis conducted on the alternative(s).

Step 4 - Surface Owner Consultation

Section 714 of the Surface Mining Control and Reclamation Act (SMCRA) requires BLM to consult with certain "qualified" owners of split estate lands (i.e., private surface ownership over federally-owned coal) when surface mining of federal coal is being considered. This effort was initiated during the scoping period for the Carbon Basin planning review.

This step does not apply to areas where only subsurface mining methods are concerned. It involves only those split estate lands within competitive federal coal lease areas that remain acceptable for consideration for leasing and development by surface mining methods after conducting the multiple use conflict evaluation.

In this consultation process, qualified surface owners are asked to express their preference for or against surface mining of the Federal coal under their private lands. An individual surface owner or significant numbers of these owners expressing a preference against surface mining, could result in identifying some of these split estate lands as unavailable for leasing and development of the Federal coal. In such cases,

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these areas can still be considered for possible leasing beyond the land use planning stage. This is possible because the actual commitment of the surface owner consent or refusal to consent does not occur until later in the coal activity planning process, or in the final processing of an individual coal lease application, prior to offering a lease for the Federal coal involved.

HOW THE PROCEDURES ARE APPLIED

The only category of coal and land mineral ownership relationships in the planning review area is that of Competitive Federal coal lease areas. Competitive federal coal lease areas are those where (1) both the land surface and the coal are federally-owned; and (2) those where the land surface is state or privately-owned and the coal is federally-owned. Competitive federal coal areas are those with the potential to be considered for new competitive Federal coal leasing for either surface or subsurface mining methods, modifications to existing leases, emergency leasing, and exchanges.

There are no BLM-administered, federally-owned lands overlying state or privately owned coal in the planning review area.

The following procedures are in accordance with the Mineral Leasing Act of 1920, the Federal Coal Leasing Amendments Act of 1976, the Federal Land Policy and Management Act of 1976, the Surface Mining Control and Reclamation Act of 1977, the Federal Coal Management Program adopted by the Secretary of Interior in June 1979 and modified by a secretarial decision issued in January 1986, and all relative Federal regulations.

Competitive Federal Coal Areas

All four steps of the screening process are applicable to these areas, when considering surface (strip) mining methods. Only steps 1-3 of the screening process are applicable to these areas when considering subsurface (underground) mining methods.

FINDINGS

The following is a summary of the findings and related recommendations resulting from conducting the coal screening process. All acreages and tonnages are approximate. Additional documentation and background information, explaining in detail how the procedures were used and the findings were derived are available for public review at the BLM Rawlins District and Great Divide Resource Area Offices.

Step 1 - Identification of Coal Development Potential

The areas of known and assumed coal development potential are shown on Figure 1.3A.

Step 2 - Application of Coal Unsuitability Criteria

The following discussion briefly explains the findings resulting from application of each unsuitability criterion.

Criterion Number 1. Federal Land Systems and Federal Lands in Communities.

No areas were determined to be unsuitable under this criterion.

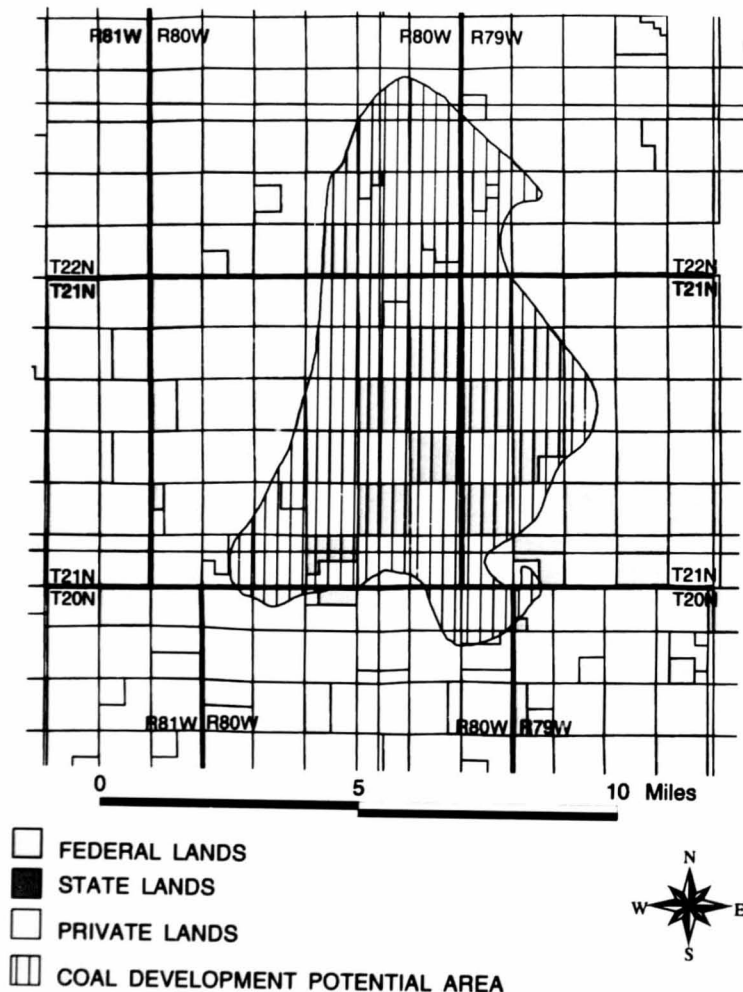


Fig. 1.3A COAL DEVELOPMENT POTENTIAL AREA

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Rationale: The planning area does not include federal surface or federal coal lands that are part of a National Park, National Wildlife Refuge, National Trail, Wilderness, National Recreation Area or National Forest, or within an incorporated city, town, or village. Also, it does not include lands that were purchased with Land and Water Conservation Fund monies.

Criterion Number 2. Rights of Way and Easements.

No areas were determined to be unsuitable under this criterion.

Rationale: Rights-of way crossing federal coal lands can be relocated to accommodate coal mining and related activities. Thus, a general determination was made that right-of-way areas would be acceptable for further leasing consideration and coal development subject to valid existing rights and negotiations for relocating (if necessary), appropriate stipulations and consistency with current planning and management decisions. Any unforeseen conflicts in these areas should be identified and resolved during the coal activity planning process, during the processing of individual coal lease applications, or in mining and reclamation plan development.

Criterion Number 3. Buffer Zones for Rights-of-Way, Communities, & Buildings.

No areas were determined to be unsuitable under this criterion.

Rationale: While there are no occupied dwellings, schools, churches, community or institutional buildings, or public parks on BLM administered public land surface in the coal development potential area, some of these structures and facilities may exist on split estate lands, and on other non-federal lands located within 300-feet of adjacent federal coal lands.

Thus, it was determined that a 100-foot buffer zone around cemeteries and a 300-foot buffer around occupied dwellings, public buildings, schools, churches, community or institutional buildings, or public parks would be unsuitable for coal mining and related surface operations and impacts. Should any conflicts arise, it would be the responsibility of the lessee to show that conflicts between mining and the buffer zone would be adequately addressed and mitigated to the satisfaction of both parties. Since the numbers and locations of these structures and facilities and the potential affect on the development of federal coal is variable and unpredictable, it was not possible to make a reasonable estimate of the acreage and coal resources affected. These situations will be addressed on a case-by-case basis in the course of processing coal lease applications and coal activity planning, prior to issuing federal coal leases.

Buffer areas for rights-of-way are unnecessary because rights-of-way generally have sufficient area to contain their functions. Additionally, if a right-of-way can be relocated, a buffer would not be necessary.

Criterion Number 4. Wilderness Study Areas.

No areas were determined to be unsuitable under this criterion.

Rationale: There are no wilderness study areas within the coal development potential area.

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Criterion Number 5. Scenic Areas.

No areas were determined to be unsuitable under this criterion.

Rationale: There are no Class I visual resource lands within the coal development potential area.

Criterion Number 6. Lands Used for Scientific Study.

No areas were determined to be unsuitable under this criterion.

Rationale: There are no scientific study areas within the coal development potential area.

Criterion Number 7. Places Included in the National Register of Historic Places.

No areas were determined to be unsuitable under this criterion.

Rationale: There are no places on federal coal lands within the coal development potential area that are included in the National Register of Historic Places (NRHP). There are several sites on federal lands which are "eligible" for listing on the NRHP, however. These are appropriately addressed later in the coal screening process as other multiple use conflicts.

Sites on BLM-administered public land surface that were reviewed include the Overland Trail, the Transcontinental Railroad grade, the Fort Halleck Road and the Town of Carbon Cemetery. Sites on private or state land surface (i.e., split estate, private or state surface/federal coal) that were reviewed include: the Fort Halleck Road and the Transcontinental Railroad grade.

Criterion Number 8. National Natural Landmarks.

No areas were determined to be unsuitable under this criterion.

Rationale: There are no designated National Natural Landmarks within the coal development potential area.

Criterion Number 9. Federally Listed Endangered Species Habitat.

No areas were determined to be unsuitable under this criteria.

Rationale: There is no known occupation of federally listed endangered species in the coal development potential area. However, habitat for endangered species in the coal development potential area have not been inventoried. The habitat is well suited for prairie dogs and, therefore, is potential habitat for black footed ferrets (*Mustela nigripes*), a federally-listed endangered species. Required surveys for prairie dog complexes will be included in the stipulations for any Federal coal lease that may be issued in the area. This will also be addressed in the Biological Assessment portion of subsequent EIS processes associated with the issuance of coal leases and with mine plan development. Any area found to support an endangered species would be acceptable for coal development with a provision that any federal coal lease issued would include a requirement for developing appropriate mitigation measures that would protect the long-term interests of the species and habitats involved. Other stipulations may be to the effect that the lessee would be required to develop mitigation measures or habitat improvement, development, or reclamation plans (in

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conjunction with mining and reclamation plan requirements) to the satisfaction of BLM and the USFWS; mitigation measures may include but would not be limited to such things as seasonal operations in some areas, off or on site habitat improvement or development, special reclamation measures, or other appropriate measures for long-term habitat protection.

A portion of the coal development potential area lies within the black-footed ferret (BFF) Primary Management Zone (PMZ) 2. BFF searches would not be required within those areas due to the experimental/nonessential designation and management guidelines presented in the ferret plan. However, because recent surveys have indicated that BFF's may have moved into PMZ2, USFWS and WGFD is recommending that ferret surveys be conducted within the PMZ's.

Criterion Number 10. State Listed Endangered Species Habitat.

No areas were determined to be unsuitable under this criteria.

Rationale: This criterion is not applicable because the State of Wyoming recognizes the Federal list of endangered species and has no separate list of its own.

Criterion Number 11. Bald and Golden Eagle Sites.

No areas were determined to be unsuitable under this criterion.

Rationale: According to the most current data available, there are no bald eagles nesting in the review area and the area is not suitable habitat for bald eagles. Three golden eagle nests have been observed on federal lands in the review area, but their status has not been determined.

It was determined that the review area would be acceptable for coal development with a provision that any federal coal lease issued in the area would include a requirement to conduct surveys for active eagle nests and for developing appropriate mitigation measures that would protect the long-term interests of the species involved. The requirement (or lease stipulation) would be to the effect that the lessee would be required to develop mitigation measures or habitat improvement/development/reclamation plans (in conjunction with mining and reclamation plan requirements) in consultation with and to the satisfaction of BLM, the USFWS, and the appropriate state agencies. Mitigation may include, but would not be limited to such things as seasonal operations in buffer zones around occupied nests, protection of active (not necessarily occupied) nests at all times (unless otherwise provided by the USFWS), off- or on-site habitat improvement or development, special reclamation measures, or other appropriate measures for long-term nest or habitat protection.

Criterion Number 12. Bald and Golden Eagle Roosts.

No areas were determined to be unsuitable under this criterion.

Rationale: According to the most current data available, there are no bald or golden eagle roosting areas in the review area.

It was determined that the review area would be acceptable for coal development with a provision that any federal coal lease issued in the area would include a requirement for developing appropriate mitigation measures that would protect the long-term interests of the species involved.

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The requirement (or lease stipulation) would be to the effect that the lessee would be required to survey for bald and golden eagle roosting activity and, if found, develop mitigation measures or habitat improvement/development/reclamation plans (in conjunction with mining and reclamation plan requirements) in consultation with and to the satisfaction of BLM, the USFWS, and the appropriate state agencies. Mitigation may include, but would not be limited to such things as seasonal operations in roosting areas, special reclamation measures, or other appropriate measures for long-term habitat protection.

Criterion Number 13. Falcon Cliff Nesting Sites.

No areas were determined to be unsuitable under this criterion.

Rationale: According to the most current data available, there are no falcon cliff nesting sites in the review area. However, prairie falcons have been observed in the area.

It was determined that the review area would be acceptable for coal development with a provision that any federal coal lease issued in the area would include a requirement to survey for falcon nesting sites and for developing appropriate mitigation measures that would protect the long-term interests of the species involved.

The requirement (or lease stipulation) would be to the effect that the lessee would be required to develop mitigation measures or habitat improvement/development/ reclamation plans (in conjunction with mining and reclamation plan requirements) in consultation with and to the satisfaction of BLM, the USFWS, and the appropriate state agencies. Mitigation may include, but would not be limited to such things as seasonal operations in buffer zones around occupied nests, protection of active (not necessarily occupied) nests at all times (unless otherwise provided by the USFWS), off or on site habitat improvement or development, special reclamation measures, or other appropriate measures for long-term nest or habitat protection, seasonal operations in roosting areas, special reclamation measures, or other appropriate measures for long-term habitat protection.

Criterion Number 14. Migratory Bird Act.

No areas were determined to be unsuitable under this criterion.

Rationale: It was determined that the review area would be acceptable for coal development with a provision that any federal coal lease issued in the area would include a requirement for developing appropriate mitigation measures that would protect the long-term interests of the species involved.

The requirement (or lease stipulation) would be to the effect that the lessee would be required to develop mitigation measures or habitat improvement/development/ reclamation plans (in conjunction with mining and reclamation plan requirements) in consultation with and to the satisfaction of BLM, the USFWS, and the appropriate state agencies. Mitigation may include, but would not be limited to such things as seasonal operations in buffer zones around occupied nests and other important habitat areas, protection of active (not necessarily occupied) nests at all times (unless otherwise provided by the USFWS), off or on site habitat improvement or development, special reclamation measures, or other appropriate measures for long-term nest or habitat protection, seasonal operations in roosting areas, special reclamation measures, or other appropriate measures for long-term nest or habitat protection.

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The following species can be found in the review area: American kestrel, *Falco sparverius*, peregrine falcon, *Falco peregrinus*, prairie falcon, *Falco mexicanus*, burrowing owl, *Athene cucularia*, Horned Lark, *Eremophila alpestris*, sage thrasher, *Oreoscoptes montanus*.

Criterion Number 15. Habitat for State High-Interest Wildlife and Plants.

No areas were determined to be unsuitable under this criterion.

Rationale: The primary habitat considerations involved with the review area are deer and antelope crucial winter ranges, and sage grouse leks and nesting areas. It was determined that the review area would be acceptable for coal development with a provision that any federal coal lease issued in the area would include a requirement for developing appropriate mitigation measures that would protect the long-term interests of the species and habitats involved.

The requirement (or lease stipulation) would be to the effect that the lessee would be required to develop mitigation measures or habitat improvement/development/ reclamation plans (in conjunction with mining and reclamation plan requirements) in consultation with and to the satisfaction of BLM and the appropriate State agencies. Mitigation may include, but would not be limited to such things as seasonal operations in some areas, off or on site habitat improvement or development, special reclamation measures (e.g., habitat recovery), timing and sequencing of mining or other appropriate measures for long-term nest or habitat protection, seasonal operations in roosting areas, special reclamation measures, or other appropriate measures for long-term nest or habitat protection.

Concerning deer and antelope crucial winter range: Mitigative measures would be combined with appropriate mining methods to temper the impacts of mining in these areas under a concept of maintaining a long-range balance between habitat and coal leasing and development.

Concerning grouse lek and nesting areas, it was determined that grouse habitat areas are acceptable for coal development with stipulations and mitigation requirements for habitat improvement, development, and reclamation. Exploration activities and ancillary facilities would be allowed provided that (1) the surface disturbing activities related to exploration and ancillary facility development avoid the lek and 1/4 mile distance from lek area, if possible, and where not possible, intensive mitigation were applied; (2) permanent and high profile structures, such as buildings, overhead powerlines, other types of ancillary facilities, etc., were prohibited in these lek and 1/4 mile distance from lek area; (3) during the grouse mating season, surface uses and activities were prohibited between the hours of 6:00 p.m. and 9:00 a.m. within 1/2 mile distance from the leks; (4) if surface disturbance in the nesting area within a two mile radius of a lek were limited to only actual mining activity and other activities were subject to seasonal limitations; and (5) if it were attempted to relocate lek and nesting complexes that are disturbed or destroyed by coal mining (relocation efforts are to be coordinated with the BLM, WGFD and other appropriate state agencies).

Criterion Number 16. Riverine, Coastal, and Special Floodplains.

The floodplain of the Medicine Bow River, located in S½NW¼NE¼, SE¼NE¼NW¼, Sec. 12, T. 20 N., R. 79 W., approximately 30 acres, was determined to be unsuitable for coal mining and related surface operations and impacts.

Rationale: With the exception of the small area of the Medicine Bow River floodplain within the review area, it was determined that the other floodplain areas within the review area can generally be mined in such a manner that all or certain stipulated methods of coal mining can be undertaken

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without substantial threat of loss to people or property and to the natural and beneficial values of the floodplain, either on a coal lease tract or downstream. Examples of lease requirements may include but are not limited to relocation of channels during mining and restoration of channel locations after mining, controlling sediment yields and prohibiting spoil dumping in channels, lining channel bottoms, revegetation and general mined land reclamation, etc. No 100-year floodplain mapping has been done for this area. However, there are riparian and wetland habitat areas mapped (National Wetlands Inventory) in the coal development potential area. These areas should be evaluated further before allowing disturbance from surface mining.

Criterion Number 17. Municipal Watersheds.

No areas were determined to be unsuitable under this criterion.

Rationale: There are no municipal watersheds within the coal development potential area.

Criterion Number 18. National Resource Waters.

No areas were determined to be unsuitable under this criterion.

Rationale: No National Resource Waters within the coal development potential area have been identified by the State of Wyoming in its water quality management plan.

Criterion Number 19. Alluvial Valley Floors.

No areas were determined to be unsuitable under this criterion.

Rationale: No alluvial valley floors have been identified by the State of Wyoming or by the BLM within the coal development potential area. The State of Wyoming usually identifies alluvial valley floor areas and mitigative measures during the mine plan approval and mine permitting stage. The area is acceptable for further leasing consideration subject to the following conditions:

In potential alluvial valley floors, or in other areas near them, where coal mining could interrupt or intercept water flow to farming areas along the drainages, mining will be permitted only with mitigative measures, that are made a part of an approved mine plan.

Criterion Number 20. Unsuitability Criteria Proposed by a State or Indian Tribe.

No areas were determined to be unsuitable under this criterion.

Rationale: Neither the State of Wyoming nor any Indian Tribes have proposed any unsuitability criteria to the Secretary of the Interior.

Summary of Results of Application of the Unsuitability Criteria

Thirty acres of public coal lands within the coal development potential area (Zero tons of surface minable coal) were determined to be unsuitable for coal mining and related surface operations and impacts. Areas found to be unsuitable for coal development and further leasing consideration were the floodplain area of the Medicine Bow River (30 acres unsuitable for both surface and subsurface mining activity). No known surface recoverable coal reserves exist at this site, but could be impacted by surface mining operations.

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Step 3 - Multiple Use Conflicts

In this step of the coal screening process those lands which were determined to be acceptable for further consideration and for coal development after applying the coal unsuitability criteria were further evaluated. This evaluation involved consideration of potential conflicts of coal development with other multiple use values (i.e., values not directly concerned with the unsuitability criteria) and identifying additional areas that would be unacceptable for coal mining or related surface operations and impacts. This step provides protection of locally, regionally, or nationally important or unique resource values and land uses. This evaluation involves only Alternative 2, the BLM's preferred alternative, because all other alternatives considered or analyzed in detail did not involve mining of the federal coal lands.

Cultural Resources

Potential Conflict: Coal development activities and related surface operations and activities would conflict with the National Register eligible Town of Carbon Cemetery.

Analysis: The town of Carbon was the first town in Carbon County. Its use dates from the development of coal for use by the railroad. While the town is abandoned, the cemetery is still regularly visited by residents of the town of Hanna. Up to 150 graves are visible and a number of others have been obscured by vegetative growth. Graves are also known to occur outside the cemetery fence.

Determinations: To preserve setting of the historic cemetery it was determined that 120 acres in the SW $\frac{1}{4}$ NW $\frac{1}{4}$, N $\frac{1}{2}$ NW $\frac{1}{4}$, Section 26, Township 22 North, Range 80 West, surrounding the Town of Carbon Cemetery were unacceptable for coal mining using surface methods and surface operations and activities related to coal mining. Mining using subsurface methods was determined to be acceptable.

Potential Conflict: Coal development activities and related surface operations and activities would conflict with cultural sites that are eligible for listing on the National Register. Included are historic sites such as the Overland Trail, the Fort Halleck Road, and the Transcontinental Railroad grade.

Analysis: These features are associated with important historic sites and contain sensitive cultural resources and would be adversely affected by surface coal mining methods and other related surface operations and activities.

Determination: Prior to coal leasing all parcels should be inventoried and a determination made as to National Register eligibility. Surface mining could be acceptable with appropriate mitigation.

Potential Conflict: Coal development activities and related surface operations would conflict with areas of traditional importance to the Arapaho Tribe.

Analysis: The review area contains one possible medicine wheel and has been previously identified by the Arapaho Tribe as having traditional importance as a vision quest site. Inventories will be conducted prior to coal leasing to identify site(s) that need to be protected from surface disturbing activities. In addition, an ethnographic study has been requested by the Arapahoe Tribe.

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Determination: If inventories and studies reveal important sites of traditional importance, the area would be open to coal development and further leasing consideration using subsurface methods only. These sites could be open to coal development and further leasing consideration using surface methods pending further study and by applying appropriate mitigation.

Producing Oil and Gas Areas

Potential Conflict: Existing oil and gas leases could conflict with orderly coal development.

Analysis: Currently 8,634.64 acres are held under federal oil and gas leases, but none of these leases have been developed. These leases present a prior existing right, and development could conflict with coal development and maximum economic recovery of coal resources.

Determination: As of this date, a draft policy addressing development conflicts between coal/oil and gas is being considered for adoption (Washington Office Instruction Bulletin No. 90-635). The final policy will guide actions involving coal/oil and gas conflicts. In addition, stipulations may be placed on federal coal leases to prevent bypass of federal coal and ensure maximum economic recovery in areas where prior rights exist.

Alternative 2 - Preferred Alternative

As described in Chapter 2, under the proposed plan 12,088.36 acres of federal coal lands containing approximately 313 million tons of coal within the Carbon Basin planning review area would be open to consideration for coal leasing and development (i.e., new competitive leasing, emergency leasing, lease modifications, and exchange proposals, under the Federal Coal Management Program) with appropriate and necessary conditions and requirements for the protection of other land and resource values and uses.

The coal development scenario in the Preferred Alternative was derived through the identification of areas as unsuitable and unacceptable. Areas identified as unsuitable (30 acres) were not included in the coal development scenario for the preferred alternative. Only the areas that were determined to be acceptable for coal development (including specified mining methods and mitigation requirements) became a part of the coal development scenario for the Preferred Alternative. As a result, there were no unacceptable adverse effects that would be caused by coal development identified in the analysis of the Preferred Alternative.

Step 4 - Surface Owner Consultation

Surface owner consultation was initiated during scoping for the planning review. Qualified surface owners were contacted and requested to express their opinion for or against surface mining the federal coal under their private lands.

There is only one qualified surface owner of split-estate lands in the review area. This surface owner expressed a preference in favor of surface mining the federal coal under the private lands. Therefore, there were no federal coal lands in the review area determined to be unavailable for further consideration for leasing and development due to surface owner consultation. It should be understood that surface owners of split estate lands still have the opportunity to consent or refuse consent to the leasing of federal coal, under their lands, before federal coal leases would be issued.

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REQUIREMENTS AND MITIGATION

Introduction

In addition to the application of the mitigation described above, lessees will be required to develop their federal leases in compliance with other applicable federal, state, and local laws and regulations. These would be considered in-place constraints on lessee activities.

All areas identified in this document as acceptable for further consideration for coal leasing are subject to the following mitigation requirements:

Cultural Resources

1. Before undertaking any activities that may disturb the surface of the leased lands, the lessee shall conduct a cultural resource intensive field inventory in a manner specified by the authorized officer of BLM on portions of the mine plan area and adjacent areas, or exploration plan area, that may be adversely affected by lease-related activities and which were not previously inventoried at such a level of intensity. The inventory shall be conducted by a qualified cultural resource specialist (i.e., archaeologist, historian, or historical architect, as appropriate) approved by the authorized officer of the surface managing agency (BLM if the surface is privately-owned). A report of the inventory and recommendations for protecting any cultural resources identified shall be submitted to the regional director of the Office of Surface Mining (OSM) and the authorized officer of BLM (or only to the authorized officer of BLM if activities are associated with coal exploration outside an approved mining permit area), to protect cultural resources on the leased land. The lessee shall undertake measures, in accordance with instructions from the regional director or authorized officer to protect cultural resources on the leased land. The lessee shall not commence the surface-disturbing activities until permission to proceed is given by the regional director or authorized officer.
2. The lessee shall protect all known cultural resource properties within the lease area from lease-related activities until the cultural resource mitigation measures can be implemented as part of an approved mining and reclamation plan or exploration plan.
3. The cost of conducting the inventory, preparing reports, and carrying out mitigation measures shall be borne by the lessee.
4. If cultural resources are discovered during operations of a lease, the lessee shall immediately bring them to the attention of the Regional Director or authorized officer, or the authorized officer of the surface managing agency if the Regional Director is not available. The lessee shall not disturb such resource except as may be subsequently authorized by the Regional Director or authorized officer. Within two (2) working days of notification, the Regional Director or authorized officer will evaluate or have evaluated any cultural resources discovered and will determine if any action may be required to protect or preserve such discoveries. The cost of data recovery shall be borne by the surface managing agency unless otherwise specified by the Authorized Officer of the BLM or of the surface managing agency (if different).
5. All cultural resources shall remain under the jurisdiction of the United States until ownership is determined under applicable law.

Paleontological Resources

If paleontological resources, either large and conspicuous and/or of significant value are discovered during construction, the find will be reported to the authorized officer immediately. Construction will be suspended within 250 feet of said find. An evaluation of the paleontological discovery will be made by a BLM-approved professional paleontologist within five (5) working days, weather permitting, to determine the appropriate action(s) to prevent the potential loss of any significant paleontological value. Operations within 250 feet of such discovery will not be resumed until written authorization to proceed is issued by the authorized officer. The lessee will bear cost of any required paleontological appraisals, surface collection of fossils, or salvage of any large conspicuous fossils of significant scientific interest discovered during the operations.

Black-footed Ferret Habitat

The lessee will be required to monitor and inventory the lease area for established or potential black-footed ferret habitat (i.e., prairie dog towns) and, if any such habitat is found, to conduct ferret inventories, all in accordance with the guidelines below. In the event that ferret occurrence is identified, the lessee shall notify the BLM and USFWS and will be required to adhere to any modifications in the mining operation provided by the USFWS and the BLM to protect the endangered species.

The following Black-footed Ferret Inventory Guidelines will be followed. Proposed developments such as coal lease lands, power plant sites, well fields, dam sites, and facilities relating to these developments should be surveyed for prairie dogs before the project is approved. If prairie dogs are found on the proposed site, colonies should be mapped on topographic maps and each colony surveyed using USFWS Black-Footed Ferret Survey Procedures. Ferret searches should be scheduled as close to actual construction as possible and not more than one year prior to disturbance to minimize the possibility of missing ferrets that might move onto the area during the period between completion of surveys and the start of construction. Where project disturbance takes place over a long period of time, such as a coal site, additional surveys or baseline studies for black-footed ferrets are recommended. Results of these surveys will be submitted to the BLM and USFWS for review and clearance. In addition, any burrowing owl nests will be noted and reported to BLM and USFWS.

APPENDIX 2

**GREAT DIVIDE RESOURCE MANAGEMENT PLAN
PLANNING ISSUES, CRITERIA AND
OBJECTIVE DECISIONS**

INTRODUCTION

The Carbon Basin area is within the area covered by the Great Divide RMP (November, 1990). The planning issues and planning criteria which were used to develop the RMP are summarized below. This summary provides an overview of those issues and concerns that were addressed in developing the RMP and that were also considered in the Carbon Basin Area planning review.

PLANNING ISSUES AND CRITERIA

The BLM planning regulations focus land-use planning on the resolution of issues that arise over the use and management of public lands and resources. A planning issue can be defined as an unrealized opportunity, an unresolved conflict or problem, or a value being lost. Not all issues are related to resource management; therefore, not all issues are planning issues that can be resolved through a resource management plan. Some must be resolved administratively.

PLANNING ISSUES

Two planning issues were addressed in the RMP that relate to coal planning. These issues developed with input from BLM personnel, the public, and other agencies, are listed below with their related planning questions. The planning questions relate to necessary decisions or resource allocations that were made in the RMP and that will be addressed in the EA for the Carbon Basin area. Only those planning questions that relate to the question, "What public lands in the Carbon Basin area are acceptable for further consideration for federal coal leasing?" will be repeated here. Refer to the RMP for a complete description of all planning questions.

Issue 1: Resource Uses Affecting Vegetation, Soils, and Watershed Values

Issue 1 addresses the conflicting demands for consumptive and nonconsumptive uses of the vegetative resources in the Great Divide Resource Area. The basic challenge is protecting resource values such as watershed, water quality, vegetative cover, and wildlife habitat while allowing resource uses that affect vegetation such as livestock grazing, timber harvest, off-road vehicle use, oil and gas development, and mining. The following questions were addressed in the RMP/EIS and will be addressed in the planning review.

What management practices or use restrictions are needed to maintain or improve wildlife habitat, especially high priority habitat, and to provide adequate habitat to support featured species? At what sites in the planning area will these management practices or restrictions be applied?

What management practices should be applied to provide essential habitat for threatened, endangered, or sensitive wildlife and plant species? In what parts of the planning area should these practices be applied?

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What vegetative uses and management practices should be allowed on wetland/riparian and aquatic habitat, and when should they be allowed?

What management practices are needed to reduce accelerated soil erosion?

What conditions of use should be applied to activities that cause or have the potential to cause adverse effects on surface and subsurface water quality and quantity?

Issue 2: Resource Accessibility

Issue 2 relates to the idea that the value or usability of some resources is enhanced by improved accessibility. The planning area contains public land resources for which there is a demand for development or use.

The development or use of oil and gas, other minerals, timber, recreation opportunities, and tracts of public land should be managed in a manner that ensures resource availability while the integrity of resource values is protected. Too much accessibility could lead to development or use that would degrade the value of such resources as visual resources, cultural resources, or wildlife habitat. Therefore, accessibility must be balanced with manageability to maintain or improve usability.

Where should utility corridors be designated, and what areas should be avoided by or excluded from utility systems, other rights-of-way, or use authorizations?

Which areas of federal coal in the planning area are acceptable for further consideration for leasing and development?

Other questions addressed in the RMP EIS relate to land disposal, access acquisition, oil and gas leasing, and recreation use.

PLANNING CRITERIA

Planning criteria are the constraints or ground rules that are developed to guide and direct the development of the RMP. Planning criteria are used to guide the collection and use of inventory information, the analysis of the management situation, the formulation of alternatives, the analysis of alternatives, and the selection of the preferred alternative.

OVERALL CONSIDERATIONS

Standard protection requirements for surface-disturbing activities have been developed by the BLM and are included in this document as Standard Mitigation Guidelines, Appendix 2. These mitigation guidelines will be used during environmental analysis of lease applications to develop appropriate mitigation measures to meet resource management objectives. In addition, more specific stipulations may be applied for some programs.

When opportunities exist for using standard stipulations and reclamation techniques consistently across program lines, they should be utilized.

All alternatives should provide for maintaining existing water quality and quantity while efforts are made to meet other resource management objectives.

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MINERALS MANAGEMENT

The unsuitability criteria established by the Federal Coal Management Program will be applied, or the application of these criteria reviewed, in all areas that contain coal with development potential. Review is needed in areas where the criteria have been applied because changes in the criteria or because of new inventory data. The coal screening process is described in the Coal Appendix, Appendix 3.

SOIL, WATER, AND AIR MANAGEMENT

Consideration will be given to the location and management of areas that are major point and nonpoint sources of water pollution. Point sources include water discharges from oil and gas wells, seismograph holes, and saline springs. Nonpoint sources include areas yielding high sediment and salt.

Riparian wetland areas should be monitored to ensure that they are not being degraded.

WILDLIFE AND FISHERIES MANAGEMENT

Management actions in floodplains and wetlands will include measures to preserve, protect, and, if necessary, restore the natural functions of such areas (as required by Executive Orders 11988 and 11990 and section 6740 of the BLM Manual). Management techniques will be used to minimize the degradation of stream banks and the loss of riparian vegetation. The design and installation of bridges and culverts will be such that adequate fish passage will be maintained.

All alternatives should contain provisions for habitat components in sufficient amounts to support mutually agreed-upon population goals established for all wildlife species in the WGFD Strategic Plan.

All alternatives should contain provisions for the wildlife program, in coordination with all other uses of land or water, to develop and maintain wildlife and fish habitat at prescribed sustained levels to achieve the following aims: (a) to prevent significant damage to rangeland and forest wildlife and fish communities; (b) to prevent and abate pollution; and (c) to direct cultural (vegetative) or management practices toward improvement of fish and wildlife habitat.

THREATENED OR ENDANGERED SPECIES

No activities will be permitted in habitat for a threatened or endangered species that would jeopardize the continued existence of the species or its habitat. Whenever possible, management actions in habitats for threatened or endangered species will be designed to benefit those species through improvement of habitat and implementation of recovery plans. The USFWS will be consulted before projects are implemented that might affect habitat of threatened or endangered species.

RMP OBJECTIVES

The RMP objective decision for coal resources is to provide for both short-term and long-term development of federal coal in an orderly and timely manner, consistent with the policies of the federal coal management program, environmental integrity, national energy needs, and related demands, to protect important resources by specifying whether federal coal can be leased for surface, subsurface, or in situ mining methods; and to allow analysis of alternative areas in consideration of future leasing activities.

Other RMP objective decisions are summarized in Appendix 5.

OTHER PLANNING DOCUMENTS

The Hanna Unit Management Framework Plan (1977) described the Carbon Basin to be an area where future leasing will be considered.

Expressions of interest in coal leasing in the late 1970s resulted in the preparation of the Final Carbon Basin Area Proposed Coal Leasing Environmental Statement (1979). The document analyzed the impacts of potential coal development in the Carbon Basin resulting in the offering of a competitive federal coal lease.

The Office of Surface Mining (OSM) will be one of the reviewing agencies in the preparation of this EA. OSM is the federal agency that administers surface coal mining operations under the Surface Mining Control and Reclamation Act of 1977.

Pursuant to the cooperative agreement between OSM and the Wyoming Department of Environmental Quality (30 CFR 950.20), once an entity receives a federal coal lease, the lessee must submit a permit application package to OSM and the Wyoming Department of Environmental Quality/ Land Quality Division (WDEQ/LQD) for any proposed coal mining and reclamation operations on federal lands in the state. A review is done by OSM, DEQ, BLM, and other federal agencies to ensure that the permit application complies with the terms of the coal lease, the Mineral Leasing Act of 1920, NEPA, and other federal laws and pertinent regulations.

Additional permitting (e.g., rights-of-ways) may be required outside of the federal coal lease, or permit application package boundary. Where applications are made to the BLM, environmental compliance will be handled on a case-by-case basis, based on program-specific requirements.

APPENDIX 3

**WYOMING BUREAU OF LAND MANAGEMENT (BLM)
MITIGATION GUIDELINES FOR SURFACE-DISTURBING
AND DISRUPTIVE ACTIVITIES**

INTRODUCTION

These guidelines are primarily for the purpose of attaining statewide consistency in how requirements are determined for avoiding and mitigating environmental impacts and resource and land use conflicts. Consistency in this sense does not mean that identical requirements would be applied for all similar types of land use activities that may cause similar types of impacts. Nor does it mean that the requirements or guidelines for a single land use activity would be identical in all areas.

There are two ways the mitigation guidelines are used in the BLM land use planning and environmental analysis processes: (1) as part of the planning criteria in developing the RMP plan alternatives, and (2) in the analytical processes of both developing the alternatives and analyzing the impacts of the alternatives. In the first case, an assumption is made that any one or more of the mitigations will be appropriately included as conditions of relevant actions being proposed or considered in each alternative. In the second case, the mitigations are used (1) to develop a baseline for measuring and comparing impacts among the alternatives; (2) to identify other actions and alternatives that should be considered, and (3) to help determine whether more stringent or less stringent mitigations should be considered.

The environmental assessment or impact statement (EA or EIS) for the land use plan does not decide or dictate the exact wording or inclusion of these guidelines. Rather, the guidelines are used in the planning and environmental analysis processes as a tool to help develop the alternatives and management options and to provide a baseline for comparative impact analysis in arriving at land use planning decisions. These guidelines will be used in the same manner in analyzing activity plans and other site-specific proposals. These guidelines and their wording are matters of policy. As such, specific wording is subject to change primarily through administrative review, not through the land use planning or environmental analysis processes. Any further changes that may be made in the continuing refinement of these guidelines and any development of program-specific standard stipulations will be handled in another forum, including appropriate public involvement and input.

PURPOSE

The purpose of the "Wyoming BLM Mitigation Guidelines" are (1) to reserve, for the BLM, the right to modify the operations of all surface and other human presence disturbance activities as part of the statutory requirements for environmental protection, and (2) to inform a potential lessee, permittee, or operator of the requirements that must be met when using BLM-administered public lands. These guidelines have been written in a format that will allow for (1) their direct use as stipulations, and (2) the addition of specific or specialized mitigation following the submission of a detailed plan of development or other project proposal, and an environmental analysis.

Those resource activities or programs currently without a standardized set of permit or operation stipulations can use the mitigation guidelines as stipulations or as conditions of approval, or as a baseline for developing specific stipulations for a given activity or program.

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Because use of the mitigation guidelines was integrated into the land use planning and environmental analysis processes and will be integrated into the site-specific environmental analysis process, the application of stipulations or mitigation requirements derived through the guidelines will provide more consistency with planning decisions and plan implementation than has occurred in the past. Application of the mitigation guidelines to all surface and other human presence disturbance activities concerning BLM-administered public lands and resources will provide more uniformity in mitigation than has occurred in the past.

MITIGATION GUIDELINES

1. Surface Disturbance Mitigation Guideline

Surface disturbance will be prohibited in any of the following areas or conditions. Exception, waiver, or modification of this limitation may be approved in writing, including documented supporting analysis, by the Authorized Officer.

- a. Slopes in excess of 25 percent.
- b. Within important scenic areas (Class I and II Visual Resource Management Areas).
- c. Within 500 feet of surface water and/or riparian areas.
- d. Within either one-quarter mile or the visual horizon (whichever is closer) of historic trails.
- e. Construction with frozen material or during periods when the soil material is saturated or when watershed damage is likely to occur.

Guidance

The intent of the SURFACE DISTURBANCE MITIGATION GUIDELINE is to inform interested parties (potential lessees, permittees, or operators) that when one or more of the five (1a through 1e) conditions exist, surface-disturbing activities will be prohibited unless or until a permittee or his designated representative and the surface management agency (SMA) arrive at an acceptable plan for mitigation of anticipated impacts. This negotiation will occur prior to development.

Specific criteria (e.g., 500 feet from water) have been established based upon the best information available. However, such items as geographical areas and seasons must be delineated at the field level.

Exception, waiver, or modification of requirements developed from this guideline must be based upon environmental analysis of proposals (e.g., activity plans, plans of development, plans of operation, applications for permit to drill) and, if necessary, must allow for other mitigation to be applied on a site-specific basis.

2. Wildlife Mitigation Guideline

- a. To protect important big game winter habitat, activities or surface use will not be allowed from November 15 to April 30 within certain areas encompassed by the authorization. The same criteria apply to defined big game birthing areas from May 1 to June 30.

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Application of this limitation to operation and maintenance of a developed project must be based on environmental analysis of the operational or production aspects.

Exception, waiver, or modification of this limitation in any year may be approved in writing, including documented supporting analysis, by the Authorized Officer.

- b. To protect important raptor and/or sage and sharp-tailed grouse nesting habitat, activities or surface use will not be allowed from February 1 to July 31 within certain areas encompassed by the authorization. The same criteria apply to defined raptor and game bird winter concentration areas from November 15 to April 30.

Application of this limitation to operation and maintenance of a developed project must be based on environmental analysis of the operational or production aspects.

Exception, waiver, or modification of this limitation in any year may be approved in writing, including documented supporting analysis, by the Authorized Officer.

- c. No activities or surface use will be allowed on that portion of the authorization area identified within (legal description) for the purpose of protecting (e.g., sage/sharp-tailed grouse breeding grounds, and/or other species/activities) habitat.

Exception, waiver, or modification of this limitation in any year may be approved in writing, including documented supporting analysis, by the Authorized Officer.

- d. Portions of the authorized use area legally described as (legal description), are known or suspected to be essential habitat for (name) which is a threatened or endangered species. Prior to conducting any onsite activities, the lessee/permittee will be required to conduct inventories or studies in accordance with BLM and U.S. Fish and Wildlife Service guidelines to verify the presence or absence of this species. In the event that (name) occurrence is identified, the lessee/permittee will be required to modify operational plans to include the protection requirements of this species and its habitat (e.g., seasonal use restrictions, occupancy limitations, facility design modifications).

Guidance

The WILDLIFE MITIGATION GUIDELINE is intended to provide two basic types of protection: seasonal restriction (2a and 2b) and prohibition of activities or surface use (2c). Item 2d is specific to situations involving threatened or endangered species. Legal descriptions will ultimately be required and should be measurable and legally definable. There are no minimum subdivision requirements at this time. The area delineated can and should be defined as necessary, based upon current biological data, prior to the time of processing an application and issuing the use authorization. The legal description must eventually become a part of the condition for approval of the permit, plan of development, and/or other use authorization.

The seasonal restriction section identifies three example groups of species and delineates three similar time frame restrictions. The big game species including elk, moose, deer, antelope, and bighorn sheep, all require protection of crucial winter range between November 15 and April 30. Elk and bighorn sheep also require protection from disturbance from May 1 to June 30, when they typically occupy distinct calving and lambing areas. Raptors include eagles, accipiters, falcons (peregrine, prairie, and merlin), buteos (ferruginous and Swainson's hawks), osprey, and burrowing owls. The raptors and sage and sharp-tailed

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grouse require nesting protection between February 1 and July 31. The same birds often require protection from disturbance from November 15 through April 30 while they occupy winter concentration areas.

Item 2c, the prohibition of activity or surface use, is intended for protection of specific wildlife habitat areas or values within the use area that cannot be protected by using seasonal restrictions. These areas or values must be factors that limit life-cycle activities (e.g., sage grouse strutting grounds, known threatened and endangered species habitat).

Exception, waiver, or modification of requirements developed from this guideline must be based upon environmental analysis of proposals (e.g., activity plans, plans of development, plans of operation, applications for permit to drill) and, if necessary, must allow for other mitigation to be applied on a site-specific basis.

3. Cultural Resource Mitigation Guideline

When a proposed discretionary land use has potential for affecting the characteristics which qualify a cultural property for the National Register of Historic Places (National Register), mitigation will be considered. In accordance with Section 106 of the Historic Preservation Act, procedures specified in 36 CFR 800 will be used in consultation with the Wyoming State Historic Preservation Officer and the Advisory Council on Historic Preservation in arriving at determinations regarding the need and type of mitigation to be required.

Guidance

The preferred strategy for treating potential adverse effects on cultural properties is "avoidance." If avoidance involves project relocation, the new project area may also require cultural resource inventory. If avoidance is imprudent or unfeasible, appropriate mitigation may include excavation (data recovery), stabilization, monitoring, protection barriers and signs, or other physical and administrative measures.

Reports documenting results of cultural resource inventory, evaluation, and the establishment of mitigation alternatives (if necessary) shall be written according to standards contained in BLM Manuals, the cultural resource permit stipulations, and in other policy issued by the BLM. These reports must provide sufficient information for Section 106 consultation. Reports shall be reviewed for adequacy by the appropriate BLM cultural resource specialist. If cultural properties on, or eligible for, the National Register are located within these areas of potential impact and cannot be avoided, the Authorized Officer shall begin the Section 106 consultation process in accordance with the procedures contained in 36 CFR 800.

Mitigation measures shall be implemented according to the mitigation plan approved by the BLM Authorized Officer. Such plans are usually prepared by the land use applicant according to BLM specifications. Mitigation plans will be reviewed as part of Section 106 consultation for National Register eligible or listed properties. The extent and nature of recommended mitigation shall be commensurate with the significance of the cultural resource involved and the anticipated extent of damage. Reasonable costs for mitigation will be borne by the land use applicant. Mitigation must be cost effective and realistic. It must consider project requirements and limitations, input from concerned parties, and be BLM approved or BLM formulated.

Mitigation of paleontological and natural history sites will be treated on a case-by-case basis. Factors such as site significance, economics, safety, and project urgency must be taken into account when making a decision to mitigate. Authority to protect (through mitigation) such values is provided for in FLPMA, Section 102(a)(8). When avoidance is not possible, appropriate mitigation may include excavation (data recovery),

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stabilization, monitoring, protection barriers and signs, or other physical and administrative protection measures.

4. Special Resource Mitigation Guideline

To protect (resource value), activities or surface use will not be allowed (i.e., within a specific distance of the resource value or between date to date) in (legal description).

Application of this limitation to operation and maintenance of a developed project must be based on environmental analysis of the operational or production aspects.

Exception, waiver, or modification of this limitation in any year may be approved in writing, including documented supporting analysis, by the Authorized Officer.

Example Resource Categories (Select or identify category and specific resource value):

- a. Recreation areas.
- b. Special natural history or paleontological features.
- c. Special management areas.
- d. Sections of major rivers.
- e. Prior existing rights-of-way.
- f. Occupied dwellings.
- g. Other (specify).

Guidance

The SPECIAL RESOURCE MITIGATION GUIDELINE is intended for use only in site-specific situations where one of the first three general mitigation guidelines will not adequately address the concern. The resource value, location, and specific restrictions must be clearly identified. A detailed plan addressing specific mitigation and special restrictions will be required prior to disturbance or development and will become a condition for approval of the permit, plan of development, or other use authorization.

Exception, waiver, or modification of requirements developed from this guideline must be based upon environmental analysis of proposals (e.g., activity plans, plans of development, plans of operation, applications for permit to drill) and, if necessary, must allow for other mitigation to be applied on a site-specific basis.

5. No Surface Occupancy Guideline

No Surface Occupancy will be allowed on the following described lands (legal description) because of (resource value).

Example Resource Categories (Select or identify category and specific resource value):

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- a. Recreation Areas (e.g., campgrounds, historic trails, national monuments).
- b. Major reservoirs/dams.
- c. Special management area (e.g., known threatened or endangered species habitat, areas suitable for consideration for wild and scenic rivers designation).
- d. Other (specify).

Guidance

The NO SURFACE OCCUPANCY (NSO) MITIGATION GUIDELINE is intended for use only when other mitigation is determined insufficient to adequately protect the public interest and is the only alternative to "no development" or "no leasing." The legal description and resource value of concern must be identified and be tied to an NSO land use planning decision.

Waiver of, or exception(s) to, the NSO requirement will be subject to the same test used to initially justify its imposition. If, upon evaluation of a site-specific proposal, it is found that less restrictive mitigation would adequately protect the public interest or value of concern, then a waiver or exception to the NSO requirement is possible. The record must show that because conditions or uses have changed, less restrictive requirements will protect the public interest. An environmental analysis must be conducted and documented (e.g., environmental assessment, environmental impact statement, etc., as necessary) in order to provide the basis for a waiver or exception to an NSO planning decision. Modification of the NSO requirement will pertain only to refinement or correction of the location(s) to which it applied. If the waiver, exception, or modification is found to be consistent with the intent of the planning decision, it may be granted. If found inconsistent with the intent of the planning decision, a plan amendment would be required before the waiver, exception, or modification could be granted.

When considering the "no development" or "no leasing" option, a rigorous test must be met and fully documented in the record. This test must be based upon stringent standards described in the land use planning document. Since rejection of all development rights is more severe than the most restrictive mitigation requirement, the record must show that consideration was given to development subject to reasonable mitigation, including "no surface occupancy." The record must also show that other mitigation was determined to be insufficient to adequately protect the public interest. A "no development" or "no leasing" decision should not be made solely because it appears that conventional methods of development would be unfeasible, especially where an NSO restriction may be acceptable to a potential permittee. In such cases, the potential permittee should have the opportunity to decide whether or not to go ahead with the proposal (or accept the use authorization), recognizing that an NSO restriction is involved.

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APPENDIX 4

Carbon Basin Coal Planning Review Area Great Divide Resource Area Wild and Scenic Rivers Review April 1997

As part of the planning effort for the Carbon Basin Coal Planning Area, The Bureau of Land Management (BLM) planning team members completed a Wild and Scenic Rivers (WSR) review of the planning area. This review was conducted on the 8,450.54 acres of BLM administered public land surface located along waterways within the planning review area, to determine if any of these lands meet the WSR eligibility criteria and suitability factors identified in the WSR Act.

PUBLIC INVOLVEMENT AND COORDINATION

Wyoming BLM personnel met with representatives of various Wyoming State Agencies, including the Governor's Office, in January 1991 and June 1993. These meetings were specifically for the purpose of reaching a mutual understanding of the Wild and Scenic Rivers Review Process, and of the Wild and Scenic Rivers Eligibility Criteria and Suitability Factors to be used in the process, in Wyoming. This included some agreement on any needed refinements of these criteria and factors, specific to Wyoming, and their statewide application on BLM administered public lands. The Eligibility Criteria and Suitability Factors, including minor refinements agreed to at that time, are consistent with the BLM WSR Manual 8351 (May 19, 1992).

It is noted that Wyoming State Government disagreed with reviewing waterways that do not contain water year-round (i.e., intermittent and ephemeral waterways). The Wyoming BLM recognizes that position but is obligated to follow the BLM Manual requirement to include intermittent and ephemeral waterways in the review.

Scoping statements and this document have been sent to interested parties, agencies and special interest groups to solicit comments and additional public involvement for the WSR review. As appropriate, notification or briefings will be given to the State and Federal Wyoming Congressional Delegation Representatives and State and Federal agencies.

News media involvement may include BLM News Releases and interviews.

PROCESS

The following definitions apply to key terms used in the Wild and Scenic Rivers Review Process:

waterway - A flowing body of water or estuary or a section, portion, or tributary thereof, including rivers, streams, creeks, runs, kills, rills, and small lakes. For purposes of this review, a waterway is not required to have water in it year-round and may be ephemeral or intermittent.

public lands - The BLM administered public land surface along waterways within a planning area. Those "split estate lands," where the land surface is State or privately owned and the federal mineral estate is administered by the BLM, are not involved in these reviews. Other references to segments, parcels, corridors and waterways, all represent public lands, which is the basis for our review.

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The BLM WSR review in the Carbon Basin Coal Planning Review Area will entail a three step process of:

1. Determining if BLM administered public lands along waterways meet the eligibility criteria to be tentatively classified as wild, scenic or recreational;
2. Determining if any of those public lands that meet the eligibility criteria also meet the wild and scenic river suitability factors; and
3. Determining how any of those public lands that meet the suitability factors will be managed.

These steps are further defined as follows:

Step 1: Wild and Scenic Rivers Eligibility Criteria Review and Tentative Classification

To meet the eligibility criteria, a waterway must be "free-flowing" and, along with its adjacent land area, must possess one or more "outstandingly remarkable" values. As part of the eligibility review, BLM planning team members reviewed all waterways in the planning area to see if they contained any BLM administered public lands that meet the eligibility criteria. Only those portions of waterways flowing through BLM administered public lands were considered. The following are the guidelines used in applying the eligibility criteria to these public lands.

1. **Free-flowing.** Free-flowing is defined in the Wild and Scenic Rivers Act (WSRA) as "existing or flowing in natural condition without impoundment, diversion, straightening, rip-rapping, or other modification of the waterway." The existence of small dams, diversion works, or other minor structures at the time the river segment is being considered shall not automatically disqualify it for possible addition to the National WSRA. A river need not be "boatable or floatable" in order to be eligible; there is no minimum flow requirement.
2. **Outstandingly Remarkable Values.** The BLM administered public land surface along waterways must also possess one or more outstandingly remarkable values to be eligible for further consideration. Outstandingly remarkable values relate to scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar resource values.

The term "outstandingly remarkable value" is not precisely defined in the WSRA. However, it should be noted that these values must be directly waterway related. The criteria for outstandingly remarkable values, used for the review of BLM administered public land surface in the Carbon Basin Coal Planning Area, are as follows:

Scenic - The landscape elements of landform, vegetation, water, color and related factors result in notable or exemplary visual features and/or attractions. Additional factors such as seasonal variations in vegetation, scale of cultural modifications, and length of time negative intrusions are viewed can also be considered when analyzing scenic values. Scenery and visual attractions may be highly diverse over the majority of the BLM administered public land surface involved; are not common to other waterways in the area; and must be of a quality to attract visitors from outside the area.

Recreational - Recreational opportunities on the BLM administered public land surface are unique enough to attract visitors from outside the area. Visitors would be willing to travel long distances to use the waterway resources on the public lands for recreational purposes. Waterway related

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opportunities could include, but are not limited to, sightseeing, wildlife observation, photography, hiking, fishing, hunting and boating.

Interpretive opportunities may be exceptional and attract visitors from outside the area. The waterway may provide settings for national or regional commercial usage or competitive events.

Geologic - The BLM administered public land surface provides an example(s) of a geologic feature, process, or phenomenon that is rare, unusual, or unique to the area. The feature(s) may be in an unusually active stage of development, represent a "textbook" example and/or represent a unique or rare combination of geologic features (i.e., erosional, volcanic, glacial and other geologic structures).

Fisheries - The fishery values on the BLM administered public land surface may be judged on the relative merits of either fish populations or habitat, or a combination of these conditions. For example:

- a. **Populations.** The waterway or waterway segment on BLM administered public land surface is a contributor to one of the top producers of resident, indigenous fish species, either nationally or regionally. Of particular significance may be the presence of wild or unique stocks, or populations of federally listed or candidate threatened or endangered species. Diversity of species is also important.
- b. **Habitat.** The BLM administered public land surface is contributing to exceptionally high quality habitat for fish species indigenous to the region. Of particular significance may be habitat for federally listed or candidate threatened and endangered species.

Wildlife - Wildlife values on the BLM administered public land surface may be judged on the relative merits of either wildlife populations or habitat, or a combination of these conditions. For example:

- a. **Populations.** The BLM administered public land surface is contributing to populations of resident or indigenous wildlife species important to the area or nationally. Of particular significance are species considered to be unique or populations of federally listed or candidate threatened or endangered species. Diversity of species is also important.
- b. **Habitat.** The BLM administered public land surface is contributing to exceptionally high quality habitat for wildlife species important in the area or nationally, or may provide unique habitat or a critical link in habitat conditions for federally listed or candidate threatened or endangered species. Adjacent habitat conditions are such that the biological needs of the species are met.

Cultural - The BLM administered public land surface contains examples of outstanding cultural sites which have unusual characteristics relating to prehistoric or historic use. Sites may be important in the area or nationally for interpreting prehistory or history; may be rare and represent an area where culture or cultural period was first identified and described; may have been used concurrently by two or more cultural groups; or may have been used by cultural groups for rare or sacred purposes.

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Historical - The BLM administered public land surface contains a site(s) or feature(s) associated with a significant event, an important person, or a cultural activity of the past that was rare, unusual, or unique in the area.

Note: Eligibility for inclusion in the National Register of Historic Places, by itself, is not sufficient justification for being considered outstandingly remarkable.

Similar Values - Other values may include significant hydrologic, paleontologic, botanic, scientific, or ecologic resources as long as they are waterway related.

3. **Tentative Classification** - At the same time that eligibility determinations are made, BLM administered public lands that meet the eligibility criteria are also given a tentative classification (wild, scenic or recreational), as required by the Act. Tentative classification is based on the type and degree of human developments associated with the BLM administered public lands involved and adjacent lands at the time of the review. Actual classification is a congressional legislative determination.

The tentative classifications, as used by BLM in Wyoming, are further defined as follows:

Wild Waterway Areas - Wild areas are those where the waterways or sections of waterways on the BLM administered public land surface are free of impoundments and generally inaccessible except by trail, with watersheds or shorelines essentially primitive and waters unpolluted. These represent vestiges of primitive America. Wild means undeveloped; roads, dams, or diversion works are generally absent from a quarter mile corridor on both sides of the waterway.

Scenic Waterway Areas - Scenic are those where the waterways or sections of waterways on the BLM administered public land surface are generally free of impoundments, with shorelines largely undeveloped, but accessible in places by roads. Scenic does not necessarily mean the waterway corridor has to have scenery as an outstandingly remarkable value; however, it means the waterway or waterway segment may contain more development (except for major dams or diversion works) than a wild segment and less development than a recreational segment. For example, roads may cross the waterway in places but generally do not run parallel to it. In certain cases, however, if a parallel road is unpaved and well screened from the waterway by vegetation, a hill, etc., it could qualify for scenic classification.

Recreational Waterway Areas - Recreational areas are those where the waterways or sections of waterways on the BLM administered public land surface are readily accessible by road or railroad, that may have some development along their shorelines, and that may have undergone some impoundment or diversion in the past. Parallel roads or railroads, existence of small dams or diversions can be allowed in this classification. A recreational area classification does not imply that the waterway or section of waterway on the public land surface will be managed or have priority for recreational use or development.

WILD AND SCENIC RIVERS SUITABILITY FACTORS

All public lands determined to meet the eligibility criteria, will be further reviewed to see if they meet the suitability factors. Some factors to consider in the suitability determination include, but are not limited to:

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1. Characteristics which do or do not make the public lands involved a worthy addition to the national WSRS.
2. Status of land and minerals ownership (surface and subsurface), land uses in the area, including the amount of private land involved, and associated or incompatible uses. Jurisdictional consideration (administrative role and or presence) must be taken into account, to the extent that management would be affected. Refer to BLM Manual 8351.33A2 (as amended on December 22, 1993) for additional information and details on the consideration of this suitability factor.
3. Reasonably foreseeable potential uses of the BLM administered public lands involved and related waters which would be enhanced, foreclosed, or curtailed if they were included in the National WSRS, and the values which could be foreclosed or diminished if the public lands are not protected as part of the System.
4. Public, State, local, tribal, or Federal interest in designation or nondesignation of any part or all of the waterway involved, including the extent to which the administration of any or all of the waterway, including the costs thereof, may be shared by State, local, or other agencies and individuals.
5. Estimated cost of acquiring necessary lands and interests in lands and of administering the area if it is added to the National WSRS. Section 6 of the WSRA outlines policies and limitations of acquiring lands or interests in land by donation, exchange, consent of owners, easement, transfer, assignment of rights, or condemnation, within and outside established river boundaries.
6. Ability of the BLM to manage and or protect the public lands involved as a Wild and Scenic River or other mechanisms (existing or potential) to protect identified values other than WSR designation.
7. Historical or existing rights which could be adversely affected. In the suitability review, adequate consideration will be given to rights held by other landowners and applicants, lessees, claimants or authorized users of the public lands involved.
8. Other issues and concerns if any.

MANAGEMENT OF BLM ADMINISTERED PUBLIC LANDS THAT MEET THE SUITABILITY FACTORS

BLM land use planning decisions will be developed and implemented for any public lands that are determined to meet the suitability factors. These planning decisions will include management objectives, management actions, and appropriate allocations of land and resource uses that will maintain the outstandingly remarkable values and tentative wild and scenic waterway classifications identified on the public lands involved.

Special Note: Pursuant to the WSRA, until the required WSR reviews or evaluations of BLM administered public lands along waterways can be completed, no uses of such lands will be authorized which could impair any outstandingly remarkable values they may contain, or that would otherwise reduce or destroy their potential eligibility, classification or suitability for consideration for inclusion in the NWSRS. There may be situations where a lengthy delay between making the eligibility determinations and the suitability determinations will occur. In such cases land use planning decisions will be developed and implemented for protection of outstandingly remarkable values on those BLM lands meeting the eligibility criteria, until the suitability review can be completed.

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Public lands that are determined to meet the suitability factors would then be managed under the BLM's land use plan management decisions, indefinitely. At some time in the future, it is possible that the Secretary of the Interior may direct the BLM to participate in the development of WSR Study Reports or joint studies may be initiated with the Forest Service or another entity. The results and documentation of the Wyoming BLM WSR reviews would be utilized in developing any such reports or studies.

ADDITIONAL WILD AND SCENIC RIVER REVIEW INFORMATION

Complete informational guidance covering the wild and scenic rivers review process can be found in BLM Manual 8351.

RESULTS OF THE WILD AND SCENIC RIVERS ELIGIBILITY REVIEW FOR THE CARBON BASIN COAL PLANNING REVIEW AREA

The WSR review team for the Carbon Basin coal planning review area met on March 10 and April 14, 1997, to conduct the WSR review for the waterways in the 8,450.54 acres of BLM administered public land surface in the review area. Because of the broad interpretation of the "free-flowing" criterion, all waterways were assumed to be free-flowing. Utilizing an interdisciplinary approach, these waterways were reviewed to determine whether any of the public lands along their courses contained any of the outstandingly remarkable values described in the WSR eligibility criteria. None of the BLM administered public lands along any of the waterways in the planning review area were found to have outstandingly remarkable values. Therefore, it was determined that none of the public lands along waterways in the planning review area meet the eligibility criteria.

Pending any new information that may be provided, during public involvement activities for the planning review, that would change this determination, no public lands along waterways in the planning review area will be reviewed under the wild and scenic rivers suitability factors and none will be given further consideration for possible inclusion in the National Wild and Scenic Rivers System. Table 4.1A lists the waterways that were reviewed and summarizes the results of the wild and scenic rivers eligibility review on the public lands in the planning review area. The public lands along First, Second and Third Sand Creeks and about 15 miles of unnamed waterways traversing the planning review area were reviewed.

Table 4.1
CARBON BASIN COAL PLANNING REVIEW AREA
WILD AND SCENIC RIVERS ELIGIBILITY REVIEW SUMMARY

WATERWAY REVIEWED	FREE FLOWING?	OUTSTANDINGLY REMARKABLE VALUES ON BLM (PUBLIC) LAND?	ELIGIBLE?
First Sand Creek	YES	NONE	NO
Second Sand Creek	YES	NONE	NO
Third Sand Creek	YES	NONE	NO
15 miles of Unnamed waterways	YES	NONE	NO

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APPENDIX 5 APPLICABLE GREAT DIVIDE RMP MANAGEMENT OBJECTIVE DECISIONS

The following management objective decisions, described in the Great Divide Resource Management Plan, apply to the Carbon Basin coal planning review area.

RMP PAGE	Excerpts of Applicable Management Objective Decisions from the Great Divide Resource Management Plan
	CULTURAL RESOURCE MANAGEMENT
11	To ensure that cultural resources are given full consideration in all land-use planning and management decisions.
11	To manage cultural resources so that scientific and socio-cultural values are not diminished, but rather are maintained and enhanced.
11	To ensure that the BLM's undertakings avoid inadvertent damage to cultural resources both federal and nonfederal.
	FIRE MANAGEMENT
13	To concentrate fire suppression efforts in areas containing high resource and/or human values and in areas with intermingled land ownership patterns, and to use prescribed fire to meet objectives in other programs.
	LANDS PROGRAM MANAGEMENT
15	To support the goals and objectives of other resource programs for managing the BLM administered public lands.
	LIVESTOCK GRAZING MANAGEMENT
24	To enhance livestock grazing while maintaining a balance between economic uses and enhancement of wildlife habitat, watershed, and riparian areas and while maintaining or improving range condition over the long term.
	MINERALS MANAGEMENT
	Leasable Minerals - Coal
26	To provide for both short-range and long-range development of federal coal in an orderly and timely manner, consistent with the policies of the federal coal management program, environmental integrity, national energy needs, and related demands; to protect important resources by specifying whether federal coal can be leased for surface, subsurface, or in-situ mining methods; and to allow analysis of alternative areas in consideration of future leasing activity.

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RMP PAGE	Excerpts of Applicable Management Objective Decisions from the Great Divide Resource Management Plan
30	Leasable Minerals - Oil and Gas To provide opportunity for leasing, exploration, and development of oil and gas while protecting other resource values.
32	Other Leasable Minerals To provide opportunity for leasing, exploration, and development of oil shale, geothermal resources, and nonenergy leasable minerals while protecting other resource values.
32	Locatable Minerals To provide opportunity for location of mining claims and mineral development while prohibiting such activities on lands that are not compatible with these types of activities.
32	Salable Minerals To provide availability of mineral materials in convenient locations for users while protecting surface resources.
33	RECREATION MANAGEMENT To ensure the continued availability of outdoor recreational opportunities, to meet legal requirements for the health and safety of visitors and to mitigate conflicts with other resource uses.
39	SOIL, WATER, AND AIR MANAGEMENT To prevent the deterioration of air quality beyond applicable local, state, or federal standards and to enhance air resources where practicable.
39	To prevent impairment of important scenic values that may be caused by declining air quality.
39	To maintain soil cover and productivity where they are adequate and to increase soil cover and productivity where they are in a downward trend.
39	To maintain riparian areas in good or excellent condition and to improve riparian areas in fair or poor condition.
39	To control flood and sediment damage from natural or human - induced causes.
39	To meet or exceed established standards for quality of surface water and groundwater where quality has been lowered by human-induced causes.
39	

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RMP PAGE	Excerpts of Applicable Management Objective Decisions from the Great Divide Resource Management Plan
39	VISUAL RESOURCE MANAGEMENT To minimize adverse effects on visual resources while maintaining the effectiveness of land-use allocations. The Carbon Basin planning review area is classified in Visual Classes III and IV.
41	WILDLIFE HABITAT AND FISHERIES MANAGEMENT To provide habitat quality (food, cover, space, and water) adequate to support a natural diversity of wildlife and fisheries, including big game, upland game, waterfowl, non-game species, game fish, sensitive, threatened and endangered species, species of special management interest in Wyoming, as well as to assist in meeting goals of recovery plans.
41	To maintain or improve vegetation condition and/or avoid long-term disturbance in high priority standard habitat sites and fisheries areas.
41	To maintain or improve overall ecological quality, thus providing good wildlife habitat, within the constraints of multiple-use management in moderate and low priority standard habitat sites.

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